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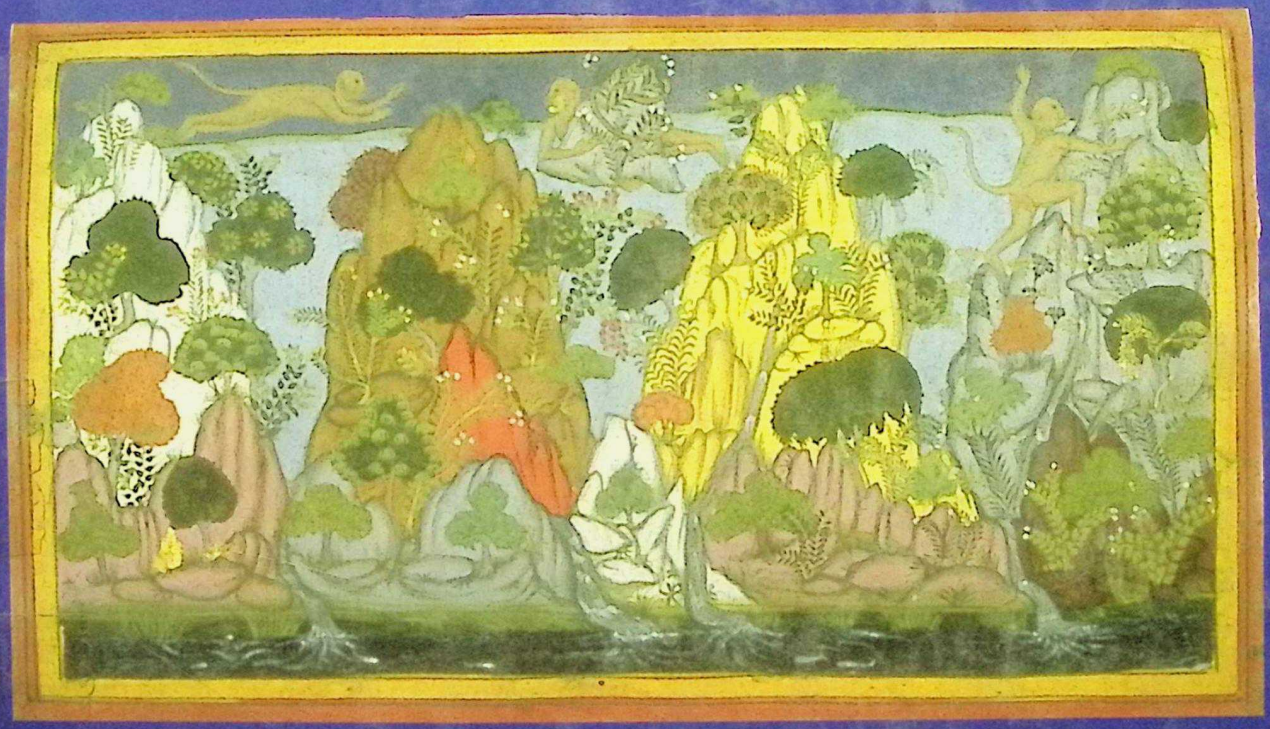

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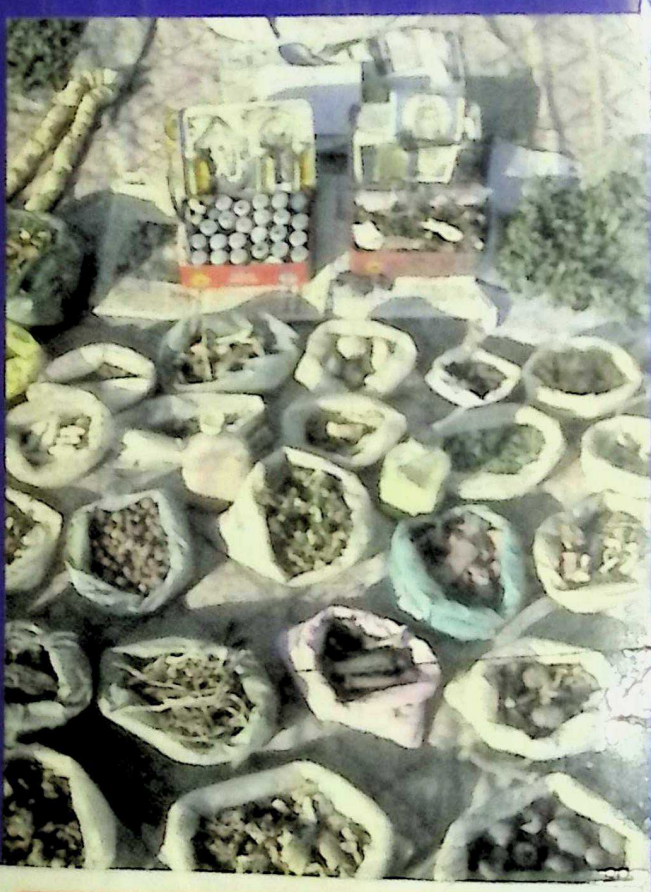

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लेखक Parrotta, John A.

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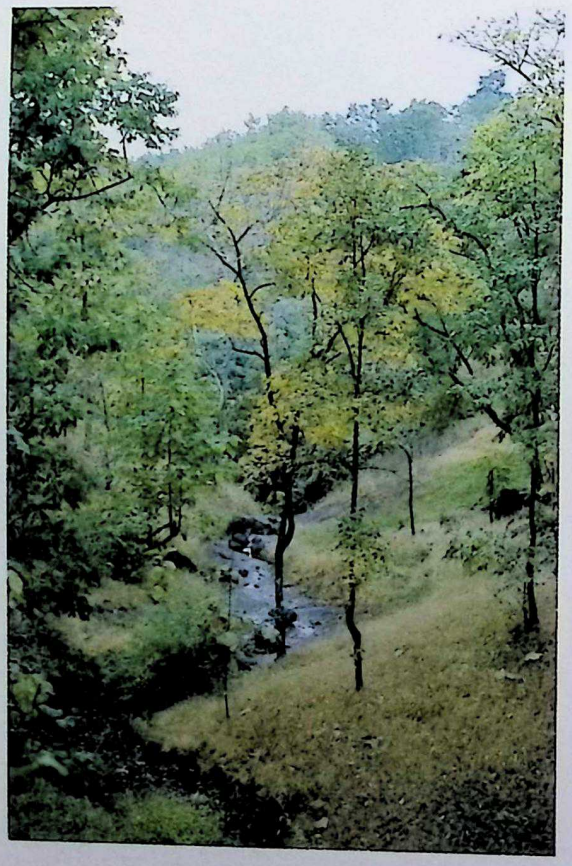

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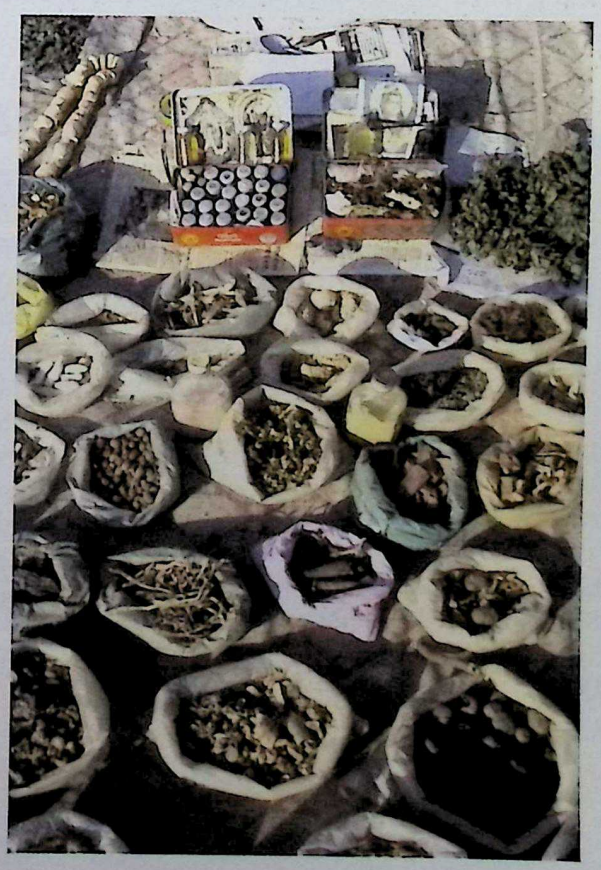

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Foreword

A few years ago, the World Health Organization (WHO) issued an appeal to 'save plants to save lives'. This is because of the realization that to achieve the goal of 'health for all', there is need for a global movement for the conservation of medicinal plants and the revitalization of the native health traditions of local communities. Such health traditions, based on medicinal plants, are the result of centuries of observation, selection and experimentation. They thus constitute an accumulated pool of medical wisdom, based on the dictum, 'an ounce of practice is worth tons of theory'. Unfortunately, such invaluable knowledge and experience are increasingly coming under the category of 'dying wisdom'.

In this timely book, *Healing Plants of Peninsular India*, Dr John Parrotta has brought together valuable information on the medicinal plant species of peninsular India, used in the indigenous systems of medicine like Ayurveda, Unani and Siddha. He has compiled information on 545 species of plants used in traditional medical practices, based on the best available published data. The information, coupled with photographs, is user-friendly and will help to promote widespread interest and understanding of these unique gifts of nature. While there is growing appreciation of the importance of medicinal plants, the threats to their very existence, as a result of unsustainable commercial exploitation and destruction of habitats rich in biodiversity, are also increasing. For example, many of the plants included in the Red Data Books of the Botanical Survey of India are known to have medicinal properties. This book will arouse interest in saving the endangered medicinal plants of peninsular India by creating awareness of their social, ecological and economic significance.

The book will also help us to understand the contributions of tribal and rural families in saving plants that help to save lives. Often the contributions of the conservers of bioresources and holders of traditional knowledge go unrecognized and unrewarded. This is why the global Convention on Biological Diversity (CBD), which came into force in December 1993, places great stress on giving concurrent attention to conservation, sustainable use and equitable sharing of benefits. This book will help to strengthen ongoing efforts to integrate the principles of ethics and equity into the commercial use of healing plants. I therefore hope it will be widely read and used.

M.S. Swaminathan
UNESCO Chair in Ecotechnology
Chennai, India
22 May 2000

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Throughout the world there is growing awareness of the value and importance of traditional and complementary medicine and particularly of medicinal plants. In many countries, plant extracts have been used for centuries and the Ayurvedic and Unani systems of India have used over 2000 plant species to treat a vast range of diseases for millennia. While it is good that the potential values of such plants are becoming more widely known, and that traditional systems of health may be recognized as being effective and economic, this may result in increasing demand. This demand for the plants themselves, and the increasing destruction of the natural forest habitats of many of them in many countries, places great emphasis on the need to develop conservation and management systems for the forests *in situ* or the individual plants *ex situ*.

To develop these systems requires a detailed knowledge of the taxonomy, morphology, ecology, reproduction, natural range and uses of each species. This book provides much of this necessary information together with beautiful photographic illustrations of almost 550 species from central and southern India. The author has made use of a large range of published and unpublished information, some of it not easily accessible to other workers.

While the book will be valuable for researchers working in botany, ecology, medicine and pharmacology, it will also be highly attractive to a broad general public and particularly to naturalists both within and outside India. There is a pleasing mixture of detailed botanical description with more general consideration of the plant, its habitat and uses. The information and its interpretation have a wider application because many of the plants, and certainly the basic concepts of traditional medicine, have been introduced in many other countries. New pharmaceutical products are being identified and their effects validated so that the conservation and production of the species will become increasingly necessary. This publication implicitly emphasizes the need for closer inter-disciplinary collaboration between biological, medical and social scientists and demonstrates the possibility of presenting scientific information in a manner that can be understood, used and enjoyed by a wide range of readers. Dr Parrotta should be congratulated on this significant contribution to the scientific literature about the species covered and this major addition to the arguments for the wise conservation and use of our natural resources.

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12 May 2000

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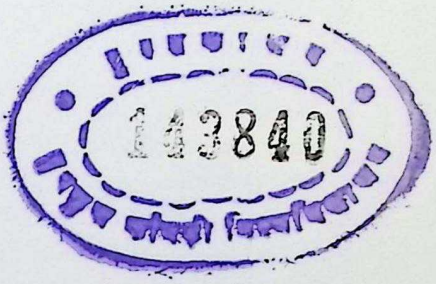

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Photo Credits

C. Kunhikannan, TFRI, Jabalpur: *Ehretia laevis* (*Boraginaceae*); *Chenopodium album* (*Chenopodiaceae*); *Bauhinia purpurea* flowers and *Bauhinia roxburghiana* foliage (*Fabaceae-Caesalpinioideae*); *Dalbergia sissoo* foliage and *Desmodium oogeinense* flowers (*Fabaceae-Papilionoideae*); *Woodfordia fruticosa* (*Lythraceae*); *Madhuca indica* fruits (*Sapotaceae*) and *Holoptelea integrifolia* fruits (*Ulmaceae*). All other photographs are by the author.

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Introduction

The spectacular technological developments and global population growth trends of the 20th century have dramatically reshaped our world and created environmental challenges unprecedented in scope and severity. Deforestation and degradation of forest, grassland and wetland ecosystems, erosion of global biodiversity, widespread desertification, agricultural productivity decline due to soil loss, marine and freshwater pollution, depletion of global marine fisheries, air pollution and global climate change are among the major environmental issues requiring solutions at the local, national, regional and international levels. Apart from their immediate negative consequences for human health, social and economic stability, and other indicators of well-being, the progressive deterioration of our natural environment poses a grave threat to the food and energy security of the majority of humanity and severely limits options for sustainable development worldwide. Global biodiversity, a good indicator of the net effects of environmental change and degradation on the health of the biosphere, is of particular importance and relevance to the future of both food security and human health. Of the many good arguments put forth in support of biodiversity conservation (or for natural resource conservation in general), its current and future role in health care is one of the most potent.

Throughout human history people have relied on natural products, and plants in particular, to promote and maintain good health and to fight sickness, pain and disease. The past 200 years have witnessed not only an acceleration in the rate of extinction of plant and animal species, but also the erosion of traditional knowledge related to the medicinal properties and uses of plants and other natural products. While 'modern' (allopathic) medicine has, in many parts of the world, replaced traditional medical practices to the benefit of individual and public health, we are becoming increasingly aware of its limitations, i.e. its ineffectiveness in dealing with a large number of conditions and diseases, the often unforeseen negative side effects of synthetic drugs, and the ever-rising costs of medical treatment, including pharmaceuticals. As a result, the public and an increasing number of physicians and public health specialists throughout

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the world are taking a second look at 'alternative' or 'complementary' medicine generally and traditional plant-based drugs in particular. Despite the concerns of some that herbal remedies are being over-sold in some countries such as the USA, there is growing recognition of their importance by physicians in North America and Europe, where alternative/complementary medicine has been practised side by side with conventional medicine for decades.

Regardless of the future of plant-based drugs in health-care systems of the more affluent countries of the world, effective Western-style medicine is neither accessible nor affordable for hundreds of millions of people worldwide (Bodeker *et al.*, 1997; Lambert *et al.*, 1997). Nowhere is this more true than in India where, in spite of the rapid and widespread diffusion of Western medical practices throughout the country during the past 150 years, the majority of the population continues to rely on traditional medicine for its health-care needs. As in China, traditional medicine in India has a more or less unbroken history going back millennia (Van Alphen and Aris, 1995). In addition to several well-known systems such as Ayurveda, Siddha and Unani that have developed in South Asia over the centuries, there still exists a wealth of uncodified knowledge that is part of the cultural heritage of the hundreds of tribal societies in India today.

Efforts to document traditional medical knowledge and systematically explore the flora of India during the past two centuries have added much to our understanding of the uses and efficacy of medicinal plants. In addition to translations of numerous classical Sanskrit and Tamil texts on Ayurveda and Siddha, and Arabic and Persian texts on Unani, late 19th-century botanical surveys and works on economic and medicinal botany by Hooker (1875–1897), Watt (1889–1896) and Dymock *et al.* (1890) have set the stage for a revival of interest in (and respect for) Indian medicine in the 20th century. During the past century, a number of standard reference works have been published that survey in great detail the traditional uses of medicinal plants. These include Kirtikar and Basu's *Indian Medicinal Plants* (1918; Kirtikar *et al.*, 1935), Nadkarni's *Indian Materia Medica* (1926, 1954), Chopra's *Indigenous Drugs of India* (1933) and more recent compendia published by the Indian Council for Industrial Research, works by Jain and colleagues such as the *Dictionary of Indian Folk Medicine and Ethnobotany* (Jain, 1991), as well as journal articles and other publications by anthropologists and ethnobotanists.

In recent decades, there has been a vigorous effort within India to conserve, document and promote knowledge of plant drugs and to develop pharmacological research programmes for the benefit of both traditional and modern medical systems. An impressive number of research centres have been established by government agencies, private organizations, universities and pharmaceutical companies to study the taxonomy, distribution, ethnobotany, cultivation, genetic improvement and the chemical and pharmacological properties of plants used in traditional Indian medicine (Mitra and Jain, 1991; International Library Association, 1996). Today there are over 500 government and non-government organizations, agencies, associations, foundations, societies and universities which study and publish on traditional Indian systems of medicine, medicinal plants and related subjects. More than 200 public and private organizations, including Ayurvedic, Siddha and Unani Colleges, offer training in medicinal plant studies, traditional Indian systems of medicine and related discplines. Throughout India, hundreds of botanical gardens, museums, germplasm and seed banks, nurseries, herbaria, analytical and testing facilities and plant drug certification services have been established to provide quality plant material and reliable information on the properties, uses and cultivation of medicinal plant species. Numerous books and nearly 200 journals and other periodicals reporting on indigenous medicinal plants are published in India each year that are available to the public through more than 100 publishers and major book distributors. In addition to an estimated 7500 Ayurvedic, Siddha and Unani pharmacies and countless numbers of

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small phyto-pharmaceutical businesses in India today, there are nearly 300 major, mostly commercial, enterprises engaged in plant drug research and manufacture.

The current resurgence of interest in traditional medicine and plant drugs occurring worldwide, but particularly in the West, is not as revolutionary as it may seem to many. The pharmaceutical industry, for example, has long recognized the therapeutic value of plants that have been used in traditional medicine for centuries, and a large proportion of the pharmaceutical drugs used today are derived from plants or based on the 'active principles' they contain. Numerous plants occurring naturally in India have yielded drugs of major importance to modern medicine. Well-known examples include rauvolfia (*Rauvolfia serpentina*), the source of the tranquillizer and antihypertensive drugs ajmaline, reserpine and rescinnamine; henbane (*Hyoscyamus niger*), from which the anticholinergic drug hyoscamine is derived; and common cowitch (*Mucuna pruriens*), the source of the antiparkinsonian drug L-DOPA.

Throughout the world, intensive pharmacological research efforts are underway to screen plants found in India and other tropical countries for active compounds and to develop new pharmaceutical products. To the extent that this research involves the development of commercial pharmaceutical products in one part of the world (more commonly in the 'North') based on plants (or other natural products) and traditional knowledge from other parts of the world (usually the floristically diverse and traditional knowledge-rich nations of the 'South'), these developments, for all their potential health benefits, raise a number of important, controversial ethical and legal issues related to intellectual property rights. It is beyond the scope of this discussion to review the merits of the opposing arguments put forth in international debates over global biodiversity treaties, international trade agreements and patent laws as they relate to the commercial use of medicinal plant resources and traditional knowledge. However, it is necessary to point out that there is considerable and mounting conflict over these issues that requires equitable resolution if future development of plant-based drugs, be they 'traditional', 'modern', or more likely a hybrid of the two, is ever to serve the diverse health-care needs of our global society.

Cynical (often successful) attempts by European or North American companies and institutions to patent age-old plant-based drugs do little to allay the suspicions of the public in India and other countries that the mutually beneficial, usually collaborative, research conducted in this field by Western/Northern-based scientists is not in fact a prelude to biopiracy and gross violation of intellectual property rights. Two prominent examples relevant to India of such new products successfully patented in the USA and other countries are neem wax and neem oil (from *Azadirachta indica*) as fungicides and insecticides (by Monsanto), and turmeric root (*Curcuma longa*) to promote the healing of wounds (by the University of Mississippi). Clearly there is a need to educate the global public, the scientific community, policy-makers and regulatory agencies on the traditional knowledge of therapeutic plants and the ethical and legal issues surrounding their commercial exploitation (Mooney, 1997).

Today, and in the decades to come, we have a golden opportunity, and indeed an obligation, to take stock of the vast store of traditional knowledge on the healing properties of the earth's plant resources and to facilitate a constructive dialogue among research scientists and medical professionals across disciplinary, political and cultural boundaries to better meet the growing health-care needs of people while effectively managing and conserving these vital resources. The present work was undertaken with this goal in mind, to introduce readers to the floristic wealth of central and southern India and its traditional use in health care. It is hoped that this work will contribute to the recognition and appreciation of the knowledge of plants and their therapeutic uses accumulated and preserved over the centuries across India's varied cultural landscape, and encourage efforts to conserve the diversity of natural ecosystems that are India's traditional pharmacy.

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The cultural and historical roots of traditional Indian medicine

Current knowledge of the properties and therapeutic use of plants in India comes from numerous sources and is closely linked to the rich cultural diversity that characterizes the Indian subcontinent.[1] Traditional Indian medicine includes both folk medicine, an oral tradition that is purely empirical in nature, which exists in all communities and reflects the country's broad ecological, ethnic and cultural diversity, and 'codified' traditional medicine systems (Ayurveda, Siddha and Unani), with strong theoretical foundations and a body of medical texts dating back hundreds, or in some cases thousands, of years (Shankar, 1996).

Of India's codified medical traditions, the oldest, and perhaps best known outside South Asia, is Ayurveda, a Sanskrit term meaning 'the knowledge (*veda*) of life (*ayu*)'. Ayurveda traces its origins to the Vedic ages (1500–800 BC). The *Rigveda* (1200–900 BC), the earliest scripture of the Hindus, and the later *Atharva Veda* contain numerous references to the healing properties of plants such as *Soma*.[2] Epics such as the *Ramayana* (*c.* 10th century BC) also allude to the use of plants to heal the wounds of battle (Vyas, 1967). In this epic, when Rama and Lakshmana, along with most of the Vanara chiefs, are wounded in battle by Indrajit's forces, Hanuman is sent to collect four medicinal herbs from the Oshadhi Hills[3] in the Himalayas: *Mritsanjivani* (a drug for resuscitating the dead), *Vishalyakarani* (to heal all wounds inflicted by weapons), *Sivarnakarani* (for restoring the original complexion to wounded limbs) and *Sandhani* (for rejoining severed limbs and healing bone fractures). Unable to locate these herbs, Hanuman uproots an entire hill and flies back to the scene of the battle.

Like other cultural traditions with deep historical roots, the development of Ayurvedic medicine has been syncretic, drawing on insights and experience derived over a long period of time from the diverse cultural and ecological landscape of India. Despite the assertions of many scholars (including the authors of early Ayurvedic works) that Ayurvedic knowledge is derived mainly from the Vedas, there is strong evidence suggesting that the early ascetic communities (Jain, Ajivika and especially Buddhist) that developed in India from the 4th century BC onwards had a major role in the evolution of Ayurveda that is not generally recognized. In contrast to the medical concepts and treatments alluded to in Vedic texts, there are close similarities between early Buddhist texts and much later Ayurvedic texts in the lists of medicinally used herbs and minerals and descriptions of specific treatments (Wujastyk, 1995). By the time of the reign of the Buddhist Emperor Asoka (274–237 BC), the importance of plants in Indian medicine was officially recognized by the state, for, in addition to state support for hospitals, hospices, dispensaries and veterinary centres, specific measures were taken by the state to promote forest conservation as well as the propagation of medicinal and other useful plants (Kapoor, 1990; Patnaik, 1993).

1 There are approximately 400 distinct tribal and other ethnic groups in India; tribal groups constitute about 7.5% of India's population (Jain, 1991).
2 A plant drug of unknown identity but believed to be a species of mushroom, *Amanita muscaria*, found in birch forests of northern Eurasia and North America (Jain, 1994).
3 *Oshadhi*, meaning 'heat-producer' in Sanskrit, is used more generally to describe all medicinal plants in ancient Sanskrit texts. This episode from the *Ramayana* is illustrated on the cover of this book.

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Ayurveda's earliest works are believed to have been composed between the 10th and 4th centuries BC. Of these, the *Materia Medica* of Charaka (*Charaka Samhita*), and Sushruta (*Sushruta Samhita*) are perhaps the best known.[4] Neither the *Charaka Samhita* nor the *Sushrita Samhita* is known in its original form; the oldest extant texts (palm-leaf manuscripts) of these works date from the second half of the first millennium AD and were apparently modified and supplemented by later authors.[5] The oldest known manuscript of the *Charaka Samhita*, composed by Drdhabala in the 9th century AD, describes the medicinal uses of 341 types of plants, plus 177 and 64 medicinal substances respectively of animal and mineral origin (Ray and Gupta, 1965). Later texts of importance to the development of Ayurveda include Vagbhata's *Astangahrdaya Samhita* (*c.* AD 600), Madhavakara's *Rugvinishcaya* (early 14th century) and the Bhavamishra's *Bhavaprakasha* (16th century). Over the years, specialized treatises have been written on a variety of subjects such as pharmacy, pharmacopoeia, pharmacology, diagnostics, special diagnostic techniques like pulse diagnosis, dietetics and preventive medicine (Dutt, 1900).

Ayurveda is a philosophy that covers the physical, metaphysical and spiritual aspects of human life. Its foremost aim is the maintenance of good health, the treatment of disease being secondary. Ayurveda as propounded by Charaka and Sushruta is divided into eight main subjects (Dutt, 1900; Ranade, 1994; Sivarajan and Balachandran, 1994): *kayachikitsa* (treatment of general diseases; internal medicine), *shalyatantra* (surgery), *vajikarana* (reproductive health and aphrodisiacs), *kaumarabhritya* (prenatal care, childbirth and paediatrics), *shalakya tantra* (ophthalmology and ENT), *agadatantra* (toxicology), *bhutavidya* (psychiatry) and *rasayana* (therapies to promote longevity and health). Like many other traditional medical systems, the theories and concepts underlying Ayurveda generally elude modern scientific explanation or translation into Western models of medicine based on reductionist scientific concepts. While some Ayurvedic specialists view the gulf between these systems' philosophical underpinnings as unbridgeable, an increasing number support the development of an integrated system of medicine that combines the traditional and allopathic concepts and treatment, stressing the need for the two systems to collaborate rather than undermine each other's foundations and credibility (Sivarajan and Balachandran, 1994; Svoboda, 1995).

Central to Ayurvedic theory is the concept of the fundamental identity between man and nature, in which man is considered to be a microcosm of the macrocosm. Both comprise five fundamental elements: earth (*prithivi*), water (*ap*), fire (*agni* or *tejas*), air (*vayu*) and ether (*akasha*). All that we ingest and subsequently digest contributes to the development of the 'seven harbingers of life' (*saptadhatus*) that comprise the biological structure of the body; i.e. *rasa* (the readily absorbable essence of digested food, often translated as lymph or plasma), *rakta* (blood), *mamsa* (muscle), *meda* (fat or adipose tissue), *asthi* (bone), *majja* (nerve tissue) and *sukla* (reproductive elements). Ayurveda further recognizes three biological systems that control all movements in the body (*vata*), take care of

4 The *Charaka Samhita* ('Charaka's Compendium') is associated with the ancient university of Taksashila (Taxilla), located near present-day Peshawar in northern Pakistan; the *Sushruta Samhita* is believed to have been composed in Benares (Wujastyk, 1995). While these and other Ayurvedic texts are ascribed to individual authors, they are generally believed to be heterogeneous compilations of knowledge derived from numerous sources.

5 Like the Vedas and other works composed in verse form in ancient India, these were part of an oral tradition passed down from one generation to the next through prodigious feats of memory by priests and scholars.

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chemical reactions and biosynthesis within the body (*pitta*), and maintain balanced growth, development and functioning (*kapha*). When these three *doshas* are harmonized and well balanced, the result is good nourishment and well-being. When there is an imbalance or disharmony within or between the *doshas*, the result is 'elemental imbalance' (*dhatuvaisamya*) leading to various ailments (Ranade, 1994; Sivarajan and Balachandran, 1994).

The Ayurvedic concept of physical health revolves around the three *doshas* and is called *tridosasiddhanta* ('philosophy of three morbidities'), a concept akin to the theory of *yin* and *yang* in Chinese medicine and the Hippocratic theory of the four humours in ancient Greek medicine (Sivarajan and Balachandran, 1994). Ayurveda's purpose is to help people maintain the three *doshas* in a balanced state and thus prevent disease; where this balance has been disrupted it seeks to restore it. It offers practical advice on diet, exercise, hygiene and daily habits, conduct and ethics, and consistently stresses moderation in all aspects of life affecting personal health.

According to the ancient Ayurvedic texts, four broad types of disease (*rogas*) are recognized, those arising from: external causes such as accidents, cuts, burns, poisonous bites (*agantuja roga*); physical causes resulting in vitiation of *doshas* in the body system (*saririka roga*); mental imbalance (*manasika roga*); and natural causes, or the painful experiences that go with human life such as birth, old age, death, hunger, thirst and sleep (*svabhavika roga*). Ayurvedic treatments often include a variety of prescriptions besides drugs that are tailored to the patient's individual functional (or *doshic*), physical and psychological constitution. Among these are purification treatments (*shodhana*) intended to cleanse the body of accumulated toxins (*panchakarma*), and palliation treatments (*shamana*) that include fasting, exercise, sunbathing, taking fresh air and exposure to wind, and herbal treatments to improve digestion or destroy toxins. The healing substances (drugs) and other treatments prescribed by Ayurvedic physicians are selected for their capacity to restore the patient's elemental balance of *vata*, *pitta* and *kapha* by promoting or depleting the *doshas* that are causing the imbalance that is the root cause of disease.

In Ayurveda, a drug's elemental composition and its influence on the elemental balance of patients is not known directly but rather is inferred from its various attributes. These attributes are called *rasa*, *vipaka*, *virya* and *prabhava*. Each *rasa* ('taste': i.e. *madhura* = sweet, *amla* = acid, *lavana* = salty, *katu* = pungent, *tikta* = bitter, *kashaya* = astringent) is endowed with three sets of qualities (*guna*: i.e. damp or dry, cold or hot, light or heavy) responsible for its pharmacological actions (*karman*). *Vipaka* (often referred to as 'post-digestive taste', is an attribute not accessible to the senses, but is defined as the ultimate effect of a drug that depends on the change in its *rasa* as it is digested. *Virya* ('potency') involves characteristics of a drug that can be either detected by the senses or inferred (i.e. 'cooling' or 'heating', 'hot' or 'cold', 'unctuous' or 'dry', 'soft' or 'sharp'). Finally, *prabhava* refers to the specific action of a drug and properties in addition to those pertaining to the other four attributes. Knowledge of these four attributes enabled the ancient Ayurvedic physicians to understand and predict the actions of drugs on their patients (Meulenbeld and Wujastyk, 1987; Sivarajan and Balachandran, 1994). Thus, all drugs used in Ayurveda are classified on the basis of these attributes and prescribed with due consideration of the constitutional nature of different patients.

Although the Ayurvedic pharmacopoeia includes many drugs of both animal and mineral origin, the vast majority are obtained from plants that are typically found in India's forests and other natural ecosystems. Ayurvedic drugs are more often than not compound mixtures composed of more than one ingredient (typically several, and often up to 50 or more), although numerous simple drugs prepared from a single species or plant part are

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used. At present there are about 1000 single drugs and 8000 compound formulations of recognized value in use by Ayurvedic practitioners in India (Ayurvedic Pharmacopoeia Committee, 1978).

A second major traditional medical system, one that is especially popular in Tamil-speaking regions of southern India, is known as Siddha (*cittar*, in Tamil). Siddha medicine is considered to be an esoteric alchemical and magical system believed to have originated from Lord Siva, with legendary links to China and Arabia. It is rooted in early Tamil writings on medicine and spirituality, folk tradition, and is strongly influenced by Ayurveda, yoga and tantric philosophy. As in Ayurveda, drugs derived from plants occupy a central position in Siddha medicine, although metals such as mercury are also commonly used to a far greater extent than in either Ayurveda or Unani medicine. Pulse diagnosis, which did not appear in Ayurvedic practice until the late 13th century, is believed to have been borrowed from Siddha (Jain, 1994; Wujastyk, 1995).

The relationship between Indian, Middle Eastern and European medical practitioners and the medicinal plant trade goes back several millennia. There is evidence of trade in Indian plants long before the early Greek and Roman eras between the Indus Valley civilization (*c.* 3rd millennium BC) and the kingdoms of ancient Egypt and the Middle East. For example coriander (*Coriandrum sativum*) seeds have been found in the tombs of Egyptian pharaohs, and Indian plants are known to have been used for dyeing textiles in Mesopotamia. At the time of King Solomon, Indian spices were traded by the Queen of Sheba to the Israelites (Patnaik, 1993). More recently the spice trade between the Romans and the kingdoms of ancient India involved a high proportion of substances used medicinally in both the European-Mediterranean region and tropical Asia (Patterson, 1987). The domination of trade routes between Europe and Asia by the merchants from the cosmopolitan Islamic world between the 7th and 15th centuries was accompanied by a considerable interchange of medical information and knowledge of the therapeutic uses of plants in India, the Mediterranean, East Africa and western Asia.[6] Works by Arab physicians of the 10th and 11th centuries incorporating Indian medical knowledge, translated into Latin in the 13th century, became standard texts in Europe and the West's principal sources of information on traditional Indian medicine until the late 18th century when works in Sanskrit were first translated into European languages (Patterson, 1987).

As early as the 9th century there were Indian doctors in Arab and Persian courts, and between the 11th and 16th centuries the repeated Muslim invasions of India were accompanied by increased exchanges of medical information and techniques between Muslim and Hindu physicians. By the time of the establishment of the Mughal Empire by Babur in 1526, the Islamic system of medicine, Unani *tibb*,[7] had begun to compete with Ayurveda (particularly among the ruling and urban upper classes), although collaboration between Ayurvedic and Unani practitioners and mutual enrichment of their respective pharmacopoeias continued (Patterson, 1987).

6 There also appears to have been considerable interchange and introduction of 'exotic' plant species during this period within the region dominated by Arab trade. An examination of the regional floras of tropical and subtropical Africa and India strongly suggest the early introduction to India of species not originally native to the subcontinent from African and Mediterranean sources. A notable example of this is tamarind (*Tamarindus indicus*), which is generally believed to have originated in the Sahelian region of Africa but was introduced to India well before the European colonial era (National Research Council, 1979).

7 Unani, sometimes spelled 'Yunani', is derived from 'Ionian', referring to the ancient Greek origin of this traditional medical system.

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Unani medicine can be traced to the ancient Greek 'theory of the four humours' of Hippocrates (460–377 BC), refined and expounded centuries later by Galen (AD 131–200), physician to the Roman emperor Marcus Aurelius. The spread of Islam across much of the ancient world from Andalusia to Persia between the 8th and 11th centuries greatly facilitated the revival of ancient Greek medicine and its further development. Galen's and other Greek medical texts were translated into Arabic and Syriac and made available to practitioners in hospitals and medical schools established throughout the Islamic world during this period. Physicians such as Hunain ibn Ishaq al'Ibidi (8th century), Abu Bakr Muhammad bin Zakariya al Razi (Rhazes, 865–925), 'Ali ibn Raban al Tabari (*c.* 810–855), and Abu 'Ali al Husain ibn 'Abd Allah ibn Sina, better known to the world as Avicenna (980–1037), are credited with the spread of Unani medicine, progressively enriched by knowledge derived from numerous sources from Morocco to India.[8] Avicenna's best-known work, *Kitab al-Qanum fi'l-tibb* ('The Canon of Medicine'), in addition to being a standard reference for Unani practitioners in South Asia, also became the major medical text in European medical schools until the 17th century. An encyclopedia covering general principles of Unani medicine, anatomy and physiology, general therapy, treatment of diseases, simple and compound drugs, and hygiene, Avicenna's *Qanun* was a major contribution to the development of Unani medicine, ordering and systematizing the available medical knowledge of that era. Like Ayurveda, Unani medicine adopted a holistic approach to health, emphasizing the need to maintain a humoral balance in its patients. It is also based on ancient texts that provide general principles, leaving specific treatments to the discretion of the physician. In Unani, as in Ayurveda, the training of doctors traditionally occurred primarily within a family setting under an apprenticeship system (Liebeskind, 1995).

Unani medicine in India closely followed the spread of Islam, depending heavily on the patronage of Muslim rulers during the dynasties of the Delhi Sultanate (1206–1526), the Mughal Empire (1526–1858), and local Muslim courts in northern and southern India. These rulers provided support for hospitals, medical libraries, schools and individual *hakims* (Unani physicians). Opinions differ on the effect of Muslim political dominance and the spread of Unani medicine on Ayurveda. Some maintain that, following a 'golden age' of Ayurveda during the early centuries AD, Ayurvedic learning, training and practice gradually declined, retreating into ritual and unquestioning adherence to ancient texts, while others consider the spread of Unani to have been mutually beneficial, resulting in the refinement of both systems. A very similar dichotomy of viewpoints has characterized discussions on the impact of Western medicine on Ayurveda, Unani and other traditional systems from the 19th century to the present day.

Following the opening of direct sea routes between Europe and India at the end of the 15th century, an era of expanded trade in spices (and medicinal plants) was opened in the early 16th century by the Portuguese with the establishment of trading bases in Goa and Cochin. Over the next 200 years many European trading bases were established along India's coasts by the Dutch (from 1609 in Pulicat, near Madras), the Danish (from 1620 at Tranquebar in the Cauvery Delta in Tamilnadu) and the French (beginning in 1675 at Chandernagore in Bengal). The English East India Company, chartered in 1600, established its first trading post in India (at Surat) in 1612. Between 1588 and 1669, the

8 Although most of the physicians and scholars credited with the renaissance of ancient Greek medical knowledge were Muslim by birth or conversion, significant contributions were made by Christians and Jews who were prominent contributors to the cultural and intellectual development of early Islamic society.

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proportion of drugs imported to England from outside Europe (mostly from India and Southeast Asia) grew from 14% to 70% (Patterson, 1987).

European studies of India's medicinal flora can be traced to Garcia da Orta's 1563 *Coloquios dos simples e drogas he cousas medicinais da India...*[9] (Markham, 1913) and van Rheede's 12-volume *Hortus malabaricus* a century later (Rheede tot Draakestein, 1678–1703). The knowledge of traditional Indian medicine and the services of Ayurvedic, Unani and other practitioners were critical to the survival of early European traders and colonists in India given the near total ignorance of tropical diseases and their treatment by European physicians. During the early European colonial period, current European medical treatments such as bleeding, purging and excessive use of mercury had little positive effect on the health of patients suffering from tropical diseases in India. As a result, during the 17th century, Indian physicians were regularly employed by the East India Company.

With the rise of English power in India during the 18th century, European attitudes towards traditional Indian medicine (mainly Ayurveda and Unani) evolved from respect to contempt. The reasons for this are more political than practical, for it was not until the late 19th century that European medical science had progressed to the point where it could compete with traditional Indian medicine in the treatment of tropical diseases. By the late 18th and early 19th century, however, the work of more enlightened Europeans such as Sir William Jones, who resided in Calcutta from 1783 until 1794 and translated a number of important Sanskrit works on science and medicine, led to a brief revival of European interest in Indian medicine.[10]

Scholarly research on Indian botany and traditional Indian medicine continued throughout the 19th century, although the British colonial powers adopted an increasingly hostile stance towards Ayurveda and other indigenous medical systems. After 1835, all official support for traditional medical education and practice was withdrawn, and the teaching of Indian medicine was thereafter confined to the home. While traditional practitioners continued to look after the health-care needs of the overwhelming majority of India's population (apart from a growing urban middle and upper class relying increasingly on 'modern' European medicine), their training was reduced to the traditional family apprenticeship system and privately sponsored colleges. Colonial government legislation passed between 1912 and 1917 further marginalized traditional medicine and made it illegal for a registered medical practitioner (trained only in Western medicine) to be associated with Indian medicine.

Since the rise of the Indian nationalist movement in the 1920s, traditional Indian medicine has received increasing recognition and, over the past 50 years, support from the Indian government. The continuing efforts of the government, universities, foundations and other non-governmental organizations and the private sector are promising indicators that Ayurveda, Unani and other traditional systems of medicine may ultimately realize their potential to offer high-quality, low-cost health care to a large proportion of India's population. However, state investments in medical education, hospitals,

9 '*Colloquies on the Simples and Drugs in India...*', printed in Goa, was the first European work on tropical medicine. It contains descriptions and discussion of 57 drugs, mostly plants, of which 25 are included in this book.

10 While diligently researching India's *materia medica*, many English physicians and scholars apparently felt the need to denigrate traditional Indian medicine, as the following passage on Ayurveda from the introduction of Ainslie's 1826 *Materia Indica* suggests: 'It is much to be lamented that it was ever found necessary to include the sciences and arts, amongst those subjects which are treated of in the sacred writings of the Hindoos; a circumstance which has been hitherto an insurmountable obstacle to improvement; and is, no doubt, one of the causes why medicine in India is still sunk in a state of empirical darkness.'

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clinics and pharmacies related to Ayurvedic, Unani and other indigenous systems have been, and continue to be, dwarfed by the support given to Western (allopathic) medicine in India. This is partially a reflection of the modernizing vision of independent India's early leaders like Jawaharlal Nehru and the success of allopathic medicine (for those who have access to it). The fact that traditional medicine is not as prominent as it might be in India today is also an indication that broad-based public support and confidence in its efficacy are often lacking. There is a continuing need for the proponents and practitioners of Ayurveda and other medical traditions to adapt to the cultural, social, economic, scientific developments of recent decades, and to support innovative education, research and development efforts aimed at meeting the health-care needs of India's rapidly growing population.

Botanical identification of traditional plant drug sources: current challenges

In earlier centuries, Ayurvedic physicians as well as practitioners of India's other codified medical traditions took an active role in the collection of medicinal plants and the preparation of simple drugs and compound formulations. In the ancient Ayurvedic texts, physicians are advised to seek the help of those with a more intimate knowledge of the natural world and of the plants used for healing purposes, i.e. hermits, shepherds and tribals. Over the years, physicians and pharmacists (and patients) have come to rely on plant drugs found in urban markets that are supplied by professional plant collectors who, not uncommonly, adulterate these drugs with other plants and thereby undermine drug quality and the credibility of the system. Until recently, there has been no effort among the practitioners of traditional medicine such as Ayurveda to adopt common standards and practices within India, and regional differences with respect to the composition, preparation and use of specific drugs persist. The need for greater quality control and quality assurance is widely recognized, and there have been increasing efforts of late within the Ayurvedic medical community and the Indian government to develop standards for prepared drugs from plant sources. However, these efforts have yet to address the continuing problems related to misidentification (either unintentional or intentional) of plant drugs in their wild state by collectors and their subsequent use in Ayurvedic formulations.

There are several reasons for continued difficulties in this area. The first relates to a lack of precision in the description of medicinal plants in the traditional texts upon which Ayurvedic physicians rely. These texts are often quite vague regarding plant identification, generally providing common (Sanskrit) names for plants that indicate specific morphological traits or habitat attributes, without the detailed botanical descriptions that are essential for correct species identification. As is usually the case with common names of plants in all languages, a single species may have several, sometimes dozens, of Sanskrit names that have come into use in various parts of the country at different times in history. Further, it is not at all uncommon that several distinct species that may or may not be taxonomically related, possessing very different therapeutic characteristics, may share the same Sanskrit names. Consequently, there are a large number of plant species whose botanical identities remain unresolved; these are usually refered to as 'controversial drugs' (Sanskrit: *sandighadravya*). Fortunately, during the past 100 years or so there have been sustained collaborative efforts among botanists and specialists in Ayurveda

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and other traditional Indian medical traditions to resolve this fundamental problem and to establish a more standardized taxonomy of plant drug sources.

Another, related, problem is a general lack of expertise in plant identification among some plant collectors and a much larger proportion of traders, pharmacists and Ayurvedic practitioners. Although Indian universities and research institutions continue to train significant numbers of botanists and field assistants with excellent plant identification skills, the overwhelming majority of people involved in the collection and marketing of medicinal plants harvested from wild sources and the processing of plant-based drugs do not possess the skills needed to ensure that Ayurvedic and other herbal drugs are unadulterated and thus correctly formulated. The resolution of this problem depends on the development of a consensus on the correct botanical identity of plants used medicinally in relation to their Sanskrit names as well as on their common names in the Indian languages used in the places where these plants are collected, marketed and processed, and the training of all those involved in these activities and the medical practitioners and pharmacists whose responsibility it ultimately is to ensure the quality of the drugs they prescribe and distribute to the public.

The forest wealth of peninsular India

India is endowed with an estimated 45,000 species of plants, including about 15,000 species of wild flowering plants. Of these, approximately 5000 species are endemic (occurring only in India) and 2500 species, representing over 1000 genera and 250 families, are used in traditional medicine (Jain, 1991). India's botanical richness arises from the complexity and diversity of its geological history, soils, topography and climate, which have created an exceptional variety of biomes and specialized habitats within the country's 3.27 million km^2 land area (Kendrick, 1989). Regions of high floristic diversity include the extensive, relatively undisturbed forest ecosystems of the Himalayas, the Khasi and Mizo Hills of northeastern India, the Vindhya and Satpura ranges of northern peninsular India, and the Western Ghats. These forests contain an estimated 90% of the country's higher (flowering) plant species and are therefore of special importance to traditional medicine. A significant proportion of medicinal plant species do occur throughout the country, however, in a variety of old-growth, successional and degraded forests, rangelands, and within the mosaic of habitats found within agricultural landscapes.

The natural vegetation of peninsular India has been subject to human disturbances of varying intensity during the thousands of years of recorded history in this region. Although deforestation of extensive land areas is as old as settled agriculture, large-scale deforestation in central and southern India is a relatively recent phenomenon dating from the late 18th century, when intensive commercial exploitation of teak and other valuable tropical timbers was initiated to supply European and, to a lesser extent, local markets for shipbuilding materials. The struggle for the colonial domination of India between England and France in the late 18th century, which shifted from Bengal to the Malabar coast during this period, was spurred by competition for control of peninsular India's forest resources to meet the needs of these countries' shipbuilding industries following the decimation of their domestic forests and the loss of their North American colonies (Grove, 1995).

During the 19th century, the pace of deforestation accelerated, first with the expanding

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influence of the East India Company over India's forest resources and later under direct British colonial rule, when administrative and land-use policies were established that usurped traditional land-tenure arrangements and long-established forest utilization practices. These new policies resulted in centralized government control over the majority of India's forests to promote logging, develop roads and railway systems, and expand India's permanent agricultural land base. Despite the introduction of modern (European) forest management practices intended to balance forest protection and commercial production in the late 1800s, India's forest area steadily declined during the first half of the 20th century due to official disregard of timber cutting limits established for reserved and protection forests, illegal logging and pressures from traditional forest users (Gadgil and Guha, 1992).

India's rapidly growing population and the demands of its agricultural and industrial development plans since 1947 have further eroded India's forest wealth. The expansion of permanent agriculture, often into marginally productive forest areas, construction of new roads and hydroelectric facilities, expansion of coal, iron and bauxite mines, and the cumulative daily pressure of millions of rural communities that rely on a shrinking forest resource base for fuel, fodder, grazing land and innumerable non-wood forest products have all contributed to reductions in both the extent and quality of the country's remaining forests.

It is estimated that, by the mid-1990s, the total area of closed forest[11] in India had been reduced to approximately 36.7 million ha (367,260 km^2, or 11.2% of the country's total land area; Forest Survey of India, 1997). Of India's total forest area, approximately 58% is found in peninsular India, including 21.8 million ha of closed forest. Although ambitious tree plantation programmes carried out in many Indian States since the 1980s have helped to reduce the overall rate of forest cover loss in the country, natural forest areas continue to decline. In peninsular India *total* forest cover[12] declined by an estimated 6000 km^2 between 1991 and 1997, while *closed* forest declined by over 19,000 km^2. In this region, the greatest losses in recent years are occurring in the dry and moist deciduous forest zones of Madhya Pradesh, Andhra Pradesh, Maharashtra and Tamilnadu (Forest Survey of India, 1993, 1997). Today, extensive forest areas in this region are largely confined to sites that are unsuitable for agriculture, including steep hill slopes and ravines, areas with relatively low human population densities, and conservation areas under strict protection. As forests and other plant-rich habitats disappear or, more commonly, are degraded, an increasing number of plant species of medicinal importance are becoming locally rare or are threatened with extinction.

Peninsular India, extending southwards from Gujarat, Madhya Pradesh and southern Bihar, is home to about 6000 species of higher plants, including an estimated 2000 endemic species. The major topographic features of this region are: the Vindhya and Satpura ranges and their extensions (the Mahadeo Hills and the Maikala range) from western to eastern Madhya Pradesh at elevations up to about 1300 m; the Chota Nagpur Plateau in southern Bihar, eastern Madhya Pradesh and the far north of Orissa; the Western Ghats and their southern extensions (Nilgiris, Palni and Cardamom Hills), which stretch along the west coast from southern Gujarat to Kerala and Tamilnadu at elevations

11 Forests with a crown cover equal to or greater than 40%; open forests (crown cover 10–40%) cover an additional 26.1 million ha, or 8.0% of the total land area in India (Forest Survey of India, 1997).

12 Both closed and open forest areas, including plantations (Forest Survey of India, 1993, 1997).

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up to about 2700 m; the Eastern Ghats from central Orissa to Tamilnadu at elevations to about 1000 m; and the eastward-tilting Deccan Plateau, bounded by these ranges at an elevation of 460–600 m and encompassing the majority of peninsular India's land area, as shown in the following relief map.

Annual rainfall patterns within peninsular India are strongly seasonal, with an extended dry season of 6–9 months depending on locality. Most rainfall in this region is associated with the southwest (or wet) monsoon between May and August, when masses of hot, humid air from the Indian Ocean pass over the subcontinent to the northeast, producing heavy rainfall on the west coast and in the Western Ghats (up to 500 cm but generally 200–350 cm per year), moderate rainfall in the eastern parts of the Vindya and Satpura ranges, the Chota Nagpur plateau and the northern ranges of the Eastern Ghats (approximately 100–200 cm per year), and lower rainfall across the Deccan Plateau and southern reaches of the Eastern Ghats (generally 50–100 cm per year, increasing from southwest to northeast). In the coastal districts of the Carnatic (eastern Tamilnadu), in contrast to the rest of peninsular India, most rainfall (100–150 mm per year) is associated with the northeast (dry) monsoon, usually between October and November. Annual temperature regimes also vary within this broad region, with average annual temperatures being lower at higher elevations (particularly in the Western Ghats and Nilgiris) than in the Deccan plains and coastal regions. Average mean daily temperatures during the warmest and coolest months range from 39°C during the summer to 15°C in the winter, with more extreme seasonal fluctuations in the drier and more northerly regions.

The soils of peninsular India are derived from the ancient crystalline rocks of Gondwana and the basaltic lava flows from the Cretaceous era. The former, which occur throughout most of eastern peninsular and southern India, have formed red sandy and loamy soils, while those derived from basaltic parent materials formed the clayey 'black cotton' soils that predominate from western Madhya Pradesh southwards through interior Maharashtra to northern Karnataka and Andhra Pradesh. The coastal regions of eastern peninsular India and parts of Kerala are characterized by deltaic and coastal alluvial soils of high fertility; extensive areas of recent alluvial soils are also found in the lower (eastern) reaches of the Mahanadi, Godavari, Krishna, Cauvery and other major rivers. On the western slopes and peaks of the Western Ghats, soils are generally classified as lateritic, which despite their inherent infertility, support tropical evergreen, semi-evergreen and deciduous forests of outstanding biological diversity.

Although now much reduced in area (see vegetation map, p. 15), peninsular India was formerly dominated by a continuum of forest types. The original geographical extent of these forests is determined by annual rainfall and temperature regimes, topography and soils. Apart from the mangrove forests that occur naturally along both coasts, there are six major forest types in this region (Government of India, 1975). Of these, tropical thorn forests, tropical dry and tropical moist deciduous forests originally covered most of the geographical area of peninsular India.[13]

13 Although the present volume includes species found in all of these forest types, the flora of these, once dominant, forest formations is best represented.

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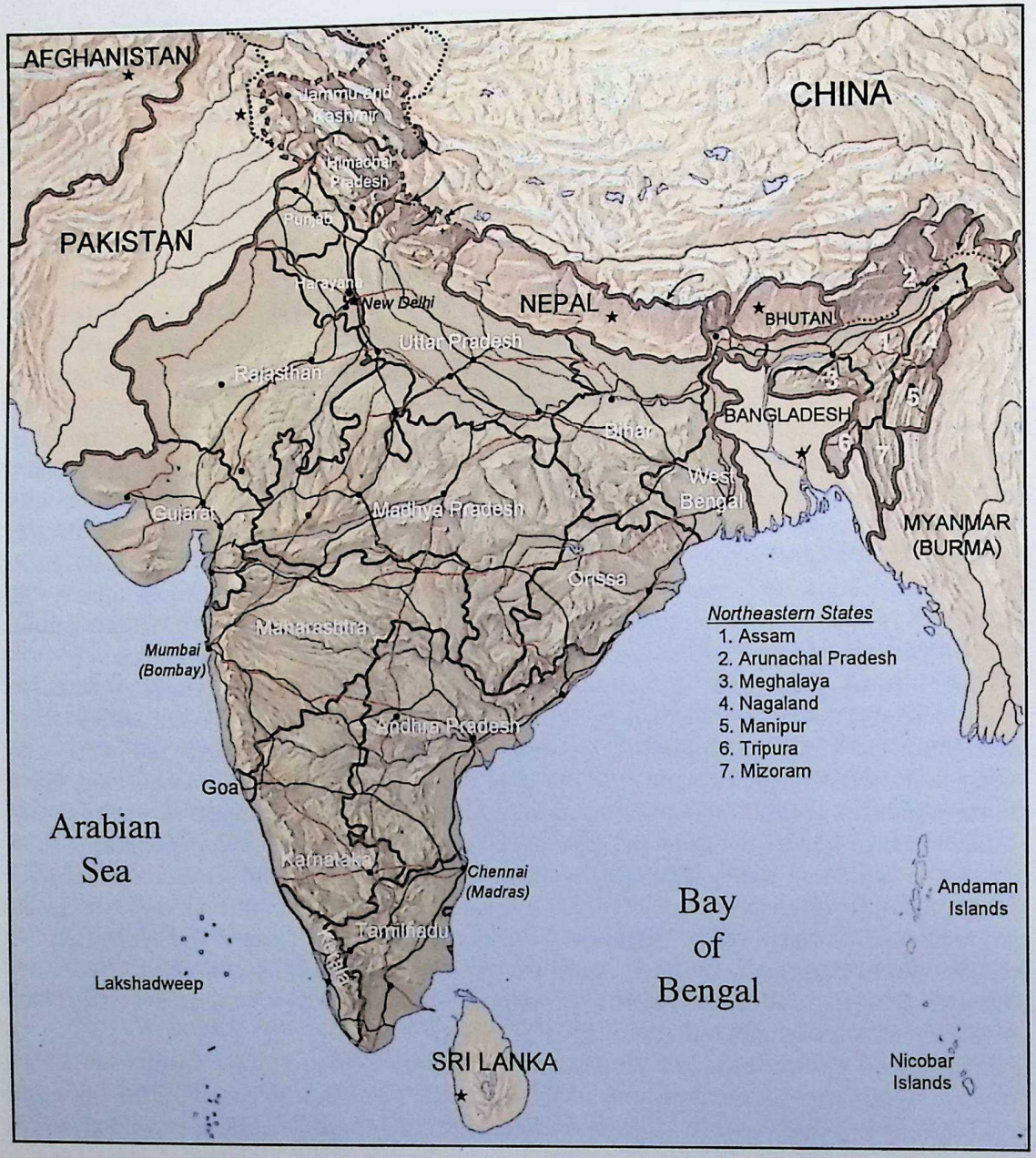

Relief map of South Asia; Indian State borders denoted by solid dark lines. Adapted and reprinted by permission of the National Geographic Society, USA

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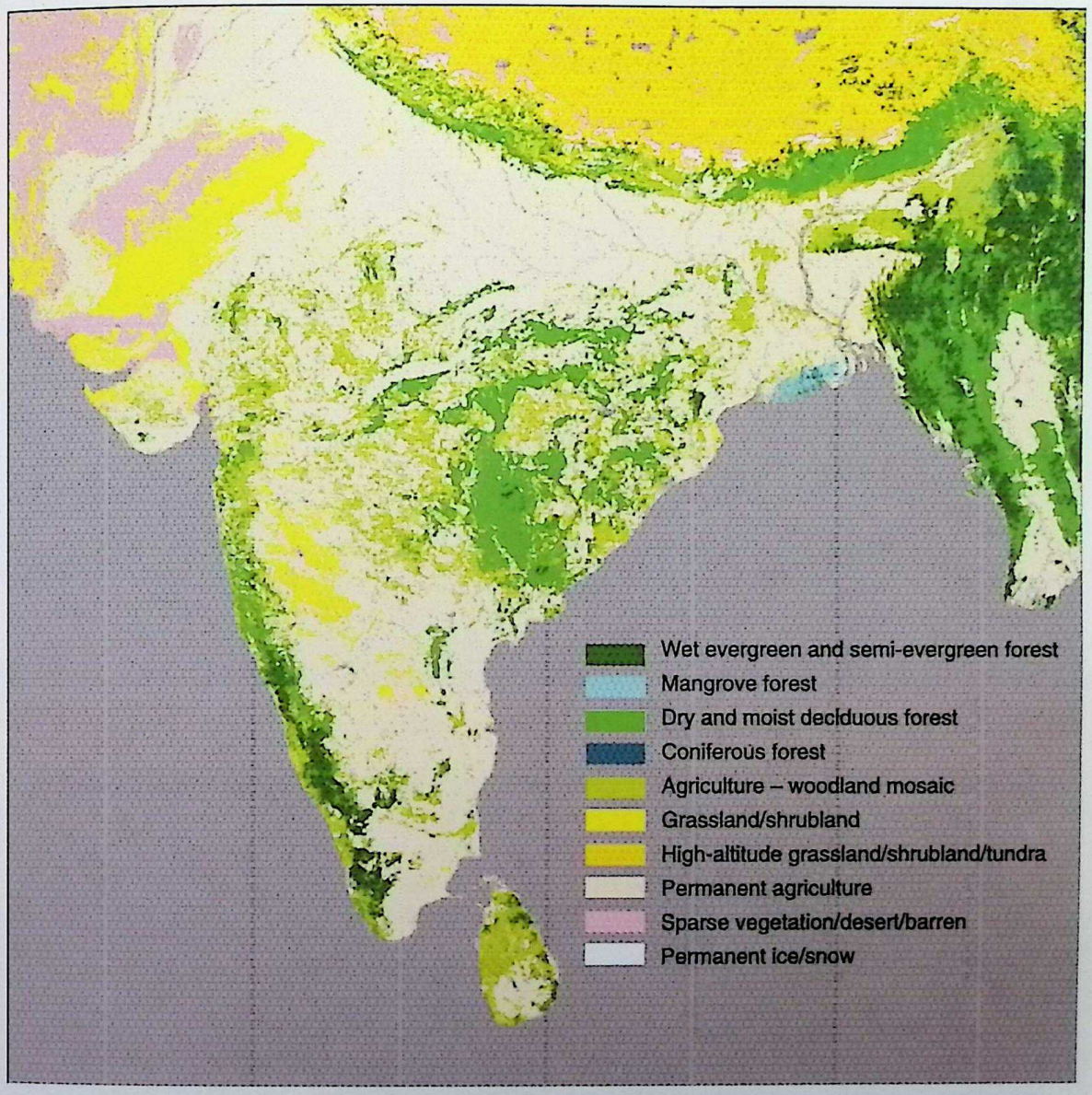

Vegetation map of South Asia, showing current (1992–1993) distribution of major natural vegetation formations (adapted from the IGDP-DIS Global 1-km Land-Cover data set DISCover: Belward *et al.*, 1999; Loveland *et al.*, 1999)

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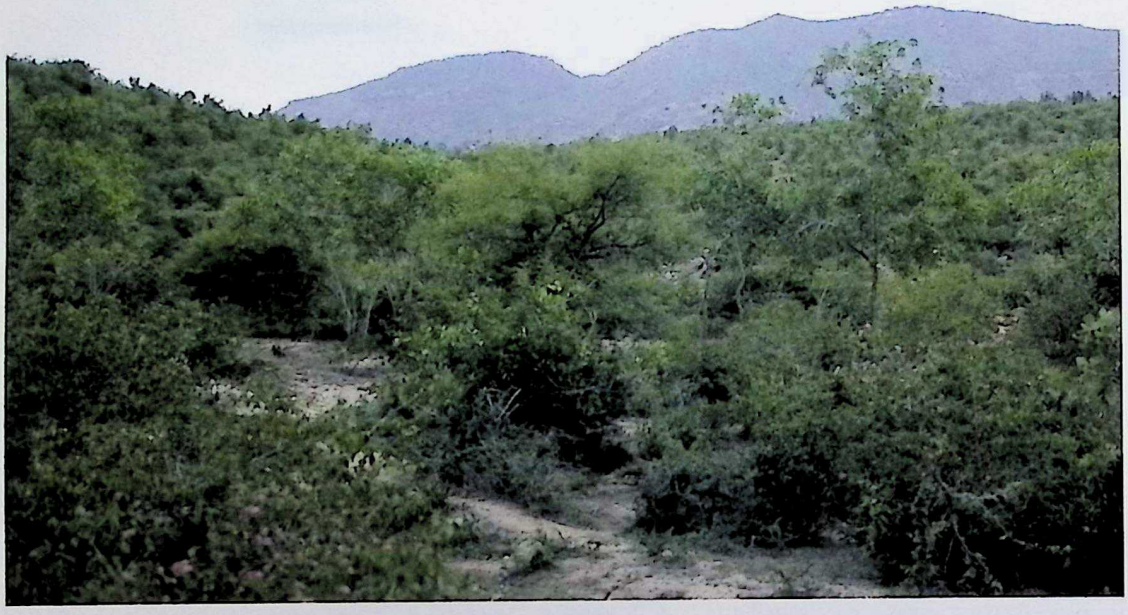

Thorn forest, southern Karnataka (Bangalore District)

- ***Tropical thorn forests*** are found in central and western Gujarat and in the drier districts of Maharashtra, Andhra Pradesh, Karnataka and Tamilnadu. Usually occurring on level sites and on plateaux, commonly on black cotton soils, these forests are usually open and consist mainly of thorny tree and shrub species, especially *Fabaceae*. Characteristic species include *Acacia* spp., *Dichrostachys cinerea*, *Balanites aegyptiaca*, *Butea monosperma*, *Capparis decidua*, *Gymnosporia spinosa*, *Phyllanthus emblica* and *Ziziphus* spp.; *Albizia amara* and the gregarious shrub *Cassia auriculata* are common in this forest type from Maharashtra and Andhra Pradesh southwards. In the driest regions of this zone, *Prosopis cineraria* is common, along with semi-desert plants such as succulent *Euphorbiaceae* species, *Capparis* spp. and other xerophytic species.
- ***Tropical dry deciduous forests*** occur in northern, western and southeastern Madhya Pradesh, eastern Maharashtra, western Orissa, central Andhra Pradesh, southern Karnataka and western Tamilnadu. Throughout much of this forest zone, teak (*Tectona grandis*) is present, often abundant, except in eastern Madhya Pradesh, Chota Nagpur and Orissa, where sal (*Shorea robusta*) replaces teak as a common species. Other characteristic tree species include *Anogeissus latifolia*, *A. pendula*, *Boswellia serrata*, *Buchanania lanzan*, *Butea monosperma*, *Chloroxylon swietenia*, *Desmodium oogeinense*, *Diospyros melanoxylon*, *Hardwickia binata*, *Holoptelea integrifolia*, *Madhuca longifolia*, *Miliusa tomentosum*, *Mitragyna parviflora*, *Phyllanthus emblica*, *Schrebera swietenioides*, *Soymida febrifuga*, *Sterculia urens*, *Terminalia alata* and *T. crenulata*. In this forest type, the most common bamboo is *Dendrocalamus strictus*. On ridges and other dry sites the major tree species are *Boswellia serrata*, *Sterculia urens* and *Cochlospermum religiosum*.
- ***Tropical moist deciduous forests*** are found in central and eastern Madhya Pradesh, southern Bihar, most of Orissa, northern Andhra Pradesh, and in coastal districts and at lower elevations of the Western Ghats from southern Gujarat to southernmost Tamilnadu. In eastern Madhya Pradesh, Chota Nagpur and Orissa, these forests are typically dominated by *Shorea robusta* (sal), which constitutes up to 90% of the upper

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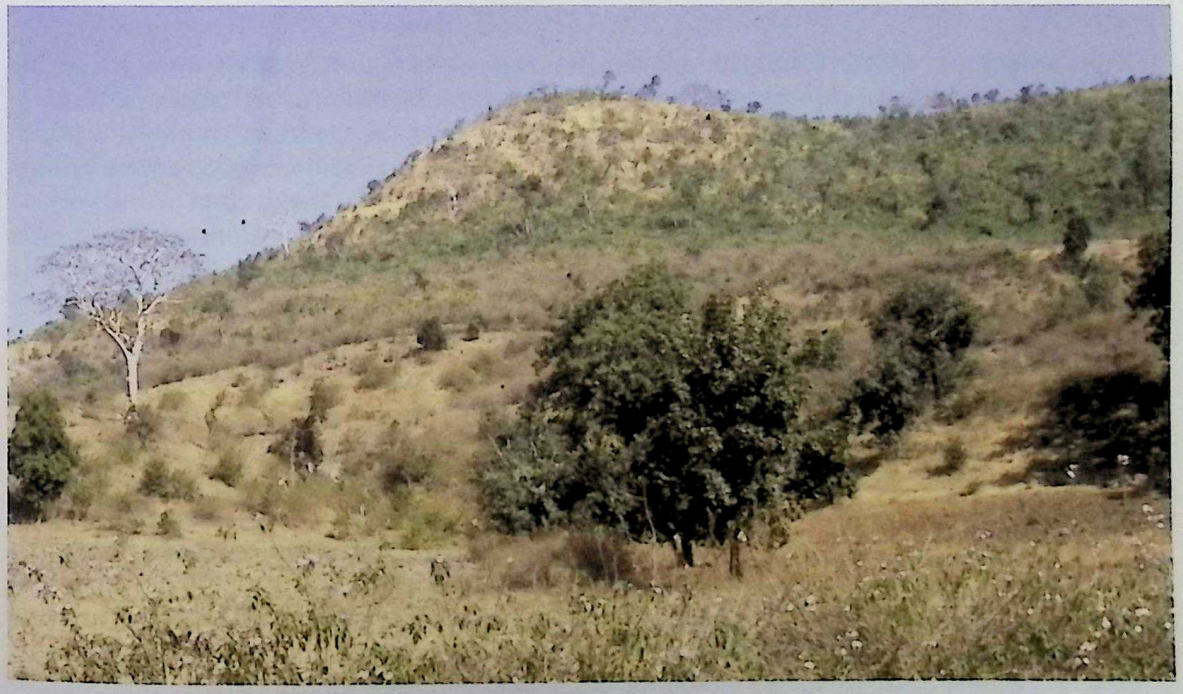
Northern dry deciduous forest, Melghat Tiger Reserve, Amravati District, northern Maharashtra



Degraded tropical dry deciduous forest landscape, northern Madhya Pradesh

canopy, which is usually 25–40 m high. Elsewhere within this forest zone, *Tectona grandis* (teak) is often present and sometimes dominant. Other common tree species include *Albizia odoratissima*, *Anogeissus latifolia*, *Bombax ceiba*, *Dalbergia latifolia*, *Diospyros tomentosa*, *Garuga pinnata*, *Haldina cordifolia*, *Lagerstroemia parviflora*, *Lannea coromandelica*, *Mitragyna parviflora*, *Pterocarpus marsupium*, *Schleicheira oleosa*, *Stereospermum chelonoides*, *S. colais*, *Terminalia bellirica*, *T. coriacea* and

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Southern dry deciduous forest landscape, Nandi Hills, southeastern Karnataka

Xylia xylocarpa. *Dendrocalamus strictus* is the most common bamboo species. In the Western Ghats area of this forest type, the tree species *Terminalia crenulata*, *T. paniculata* and *Lagerstroemia lanceolata* are commonly found (but are absent elsewhere); in addition to *Dendrocalamus strictus*, *Bambusa arundinacea* and *Oxyrenanthera monostigma* are the common bamboo species in these forests.

- ***Tropical dry evergreen forests*** are restricted to the coastal districts of Tamilnadu from Chennai (Madras) to Ramanathapuram. The dominant tree species include *Canthium dicoccum*, *Diospyros montana*, *Drypetes sepiaria*, *Eugenia* spp., *Maba buxifolia*, *Manilkara hexandra*, *Memecylon edule*, *Mimusops elengi*, *Pterospermum suberifolium*, *P. heyneanum* and *Strychnos nux-vomica*. This forest formation has been severely degraded and reduced in extent, and occurs mainly in small, isolated patches.
- ***Tropical wet evergreen forests*** occur at the highest elevations in the Western Ghats from northwestern Karnataka to Kerala and western Tamilnadu. These are multi-strata forests with dominant canopy trees up to 45–50 m height, often with buttressed bases, an intermediate tree stratum composed mainly of evergreen species, and a lower stratum consisting of dense, shrubby, evergreen undergrowth. Epiphytes (aroids, ferns, mosses and orchids) are abundant, climbers are present but not conspicuous, and ground vegetation is usually sparse. In disturbed or early successional forests of this type, dense growth of canes and palms is typical. The tree species commonly found in these forests are *Acrocarpus fraxinifolius*, *Artocarpus heterophyllus*, *A. hirsutus*, *A. lakoocha*, *Calophyllum elatum*, *Canarium strictum*, *Cullenia rosayroana*, *Dipterocarpus indicus*, *Dysoxylum malabaricum*, *Hopea parviflora*, *H. wightiana*, *Hydnocarpus laurifolia*, *Mangifera indica*, *Mesua ferrea*, *Palaguium ellipticum*, *Pterygota alata*, *Syzygium* spp., *Tetrameles nudiflora*, *Toona ciliata*, *Vateria indica* and numerous species of *Lauraceae* and *Myristicaceae*. A large proportion of these forests have been brought under shifting cultivation or converted to spice, betel-palm, coffee and rubber plantations.

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Wet evergreen forest landscape, Western Ghats (near Agumbi, Shimoga District, Karnataka)

- ***Tropical semi-evergreen forests*** occur at middle elevations in the Western Ghats from northwestern Maharashtra to southern Kerala. These forests represent an intermediate type between the evergreen and moist deciduous forests found in this region, and though less diverse and shorter in stature than evergreen forests, usually include species characteristic of both forest types. They are closed forests that include both evergreen and deciduous tree species; epiphytes and climbers are usually abundant, and bamboos are present though not as common as in moist deciduous forests. Some of the typical tree species found in these forests are: *Adina cordifolia*, *Artocarpus hirsutus*, *Acrocarpus fraxinifolius*, *Bombax ceiba*, *Dalbergia latifolia*, *Grewia tiliaefolia*, *Holigarna* spp., *Holoptelea integrifolia*, *Hopea parviflora*, *Lagerstroemia lanceolata*, *Lophopetalum wightianum*, *Machilus macrantha*, *Pterocarpus marsupium*, *Terminalia crenulata*, *T. paniculata*, *Vateria indica* and *Xylia xylocarpa*.

Preparation and organization of the book

This book contains information on 545 species of trees, shrubs, climbers, herbs, grasses and ferns used in traditional Indian medicine that are found in peninsular India. Included are representives of 109 families of flowering plants and three families of ferns (one species each of *Adiantaceae*, *Marsileaceae* and *Parkeriaceae*). Most of these are native or naturalized exotic species that occur naturally in the wild within this region, although a small proportion are species introduced from other regions (in India or other tropical regions) and known only under cultivation in peninsular India. Largely excluded are the numerous cultivated food crops and spices that are described in most works on Indian *materia medica*. The species described in this volume represent about 40–50% of the plant species whose

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therapeutic uses have been thus far documented, and include the vast majority of the more important medicinal species native to or cultivated in this region.

Species are organized alphabetically by family, genus and species, following for the most part the taxonomic classification system described in Brummit and Powell (1992) using the currently accepted scientific names.[14] Common botanical synonyms are followed by a listing of the most frequently used local (vernacular) names in all of the major languages used in peninsular India[15] plus English and Sanskrit. For Sanskrit, given that many species have numerous names, often 20 or more, only those most frequently used in the literature are listed.[16] The botanical descriptions and information on distribution and habitat were distilled from a variety of local and regional flora, occasionally augmented by field observations.

Information on the therapeutic uses of each species was compiled from numerous publications and is, to the best of the author's knowledge, accurate.[17] It is derived from several classic sources such as Kirtikar and Basu's *Indian Medicinal Plants* first published in 1918, Nadkarni's *Indian Materia Medica* (1926, 1954), and more recent compendia published during the past 50 years by the Indian Council of Scientific and Industrial Research such as the *Wealth of India* series (CSIR, 1948–1992). It also includes information from more recent literature on Ayurvedic and Siddha medicine, notably Sivarajan and Balachandran (1994) and Yoganarasimhan (1996), and ethnobotanical studies published in scientific journals, particularly *Ethnobotany*, published by the Society of Ethnobotanists, based at the National Botanical Research Institute in Lucknow. These references are listed at the end of each species description. Excluded from this work is information on the chemistry of these plant drugs; this information is very extensive and can be found in existing publications, including numerous professional journals and medicinal plant information databases (International Library Association, 1996; Bhat, 1997).

Each species description is accompanied by one or more illustrative photographs intended to facilitate identification of living plants in the field. Nearly all of these photographs were taken in the field during the course of the author's work over several months in 1994 and in 1997. The plant specimens photographed were collected in natural forest areas, villages and botanical gardens located in several districts in central Madhya Pradesh, northern Maharashtra (the Melghat Tiger Reserve in particular) and southern Karnataka.[18]

Following the species description is a bibliography that includes works cited in the text as well as a number of other publications, mostly floras, referred to during the writing of this book. Glossaries of botanical and medical terms used in the text are followed by a series of common name indexes, an index of scientific names and botanical synonyms, and an index of medicinal uses.

14 Exceptions to this were made in the case of the families *Compositae* (included under *Asteraceae*), *Cruciferae* (*Brassicaceae*), *Guttiferae* (*Clusiaceae*), *Labiatae* (*Lamiaceae*), *Leguminosae* (*Fabaceae*), *Palmae* (*Arecaceae*), *Umbelliferae* (*Apiaceae*).

15 Bengali, Gujarati, Hindi, Kannada, Konkani, Malayalam, Marathi, Oriya, Punjabi, Tamil, Telegu and Urdu.

16 Kareem (1997) was used extensively, though not exclusively, for selecting the Sanskrit names included.

17 By no means exhaustive, this information is intended to provide the reader with a general understanding of the often broad range of therapeutic uses of these plant species in traditional Indian medicine. It is in no way intended to serve as a guide for self-treatment or a substitute for professional medical care by trained health-care specialists in traditional or allopathic medicine.

18 In Madhya Pradesh, Jabalpur and Seoni Districts; in Maharashtra, Amravati District; in Karnataka, Bangalore, Chikmagalur, Shimoga and Tumkur Districts.

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Species Descriptions

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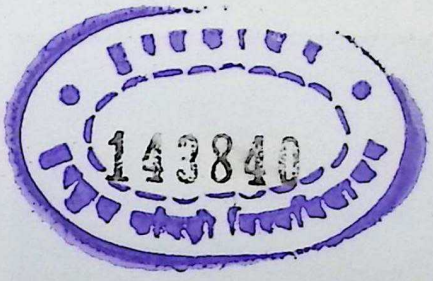

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Acanthaceae

Andrographis paniculata Nees

Botanical synonyms

Andrographis subspathulata C.B. Clarke, *Justicia paniculata* Burm. f.

Common names

Bengali: kalmegh, mahatita; ***English***: creat, king of bitters; ***Gujarati***: kariyatu, kiriyata, kiryato, olikiriyat; ***Hindi***: bhuineem, chirayata, kalmegh, kirayat, kiryat, mahatita; ***Kannada***: kreata, kreata, nelaberu, nelabevinagida, nelabevu; ***Malayalam***: kiriyatta, kiriyattu, nelaveppu; ***Marathi***: olenkirayat, olikiryata; ***Oriya***: bhuinimba; ***Sanskrit***: bhunimba, bhunimbah, kirata, kiratatiktah; ***Tamil***: nilavembu, shiratkuchi; ***Telegu***: neelaveemu, nelavemu.

Description

A branched, annual herb 0.3–1 m tall; stems and branches sharply quadrangular with longitudinal furrows and wings on the angles of the younger parts. Leaves simple, opposite, short-petioled, glabrous, elliptic to lanceolate, narrowed at both ends, acute at apex, 2.5–8 cm long and 2.5 cm wide. Flowers small, white with purplish blotches or rose-coloured, borne in lax, spreading terminal and axillary panicled racemes. Fruit a linear-oblong, compressed capsule, acute at both ends, 1.9 cm long and 0.3 cm wide; seeds numerous, subquadrate, yellowish-brown. Flowers from August to December and fruits mature from February to March in most parts of the country.

Distribution and habitat

Found mainly in the plains from Himachel Pradesh to Assam and Mizoram southwards through peninsular India and in Sri Lanka. It is common in moist, shady habitats in uncultivated fields and also as an understorey species in dry forests. It is also cultivated in some parts of the country.

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Medicinal properties and uses

The herb is reported to possess astringent, anodyne, tonic and alexipharmic properties, and is used for treating dysentery, cholera, diabetes, consumption, influenza, bronchitis, swellings and itches, piles and gonorrhoea. The dried leaves and tender shoots constitute the well-known drug *Kalmegh*, or 'green chiretta', which is the principal ingredient of a reputed household medicine used as a bitter tonic and febrifuge. It is also the major constituent of the Ayurvedic drug *Switradilepa*, used to treat vitiligo, a skin disease. A decoction of the plant is considered a blood-purifier, used for treating jaundice and torpid liver, and its extract or infusion is reportedly used to relieve fever. The powdered plant mixed with goat's milk is taken over a 40-day period as a treatment for tuberculosis in northeastern Karnataka. The leaf juice is taken orally to treat jaundice among the tribal inhabitants of northeastern Madhya Pradesh. Among the Paudi Bhuinya of northern Orissa, a paste of the fresh plant is applied to the scalp to kill head lice. The dried, powdered plant is taken with black pepper as a prophylactic against malaria, or with water and sugar as a liver tonic among the tribal inhabitants of eastern Bihar. A decoction prepared from the leaves is used to relieve diarrhoea among the Bondo tribal people in southern Orissa, and to treat malaria by the Kondhs in southwestern Orissa. The macerated leaves and juice, mixed with spices such as cardamom, clove and cinnamon, are made into pills that are prescribed to relieve gripe and other stomach ailments in children. The dried, powdered leaves are given to men to treat sexual weakness among the tribal inhabitants of southern Bihar. A decoction or infusion of the leaves is considered useful for treating general debility and dyspepsia. In northeastern Karnataka the leaf juice is taken as a remedy for stomach-ache. The leaves and roots are also used as a febrifuge, tonic, stomachic, cholagogue and aperient. A tincture of the root is considered tonic, stimulant and aperient. Among the Kondhs in southwest Orissa, the dried, powdered root is given with water to children as an anthelmintic; made into a paste with turmeric (*Curcuma longa*: *Zingiberaceae*), it is applied to relieve itching and skin rashes.

References

Aminuddin and Girach (1991, 1996), Asolkar *et al.* (1992), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Girach (1992), Girach and Aminuddin (1995), Hemadri and Rao (1989), Jha and Varma (1996), Kirtikar *et al.* (1935), Kumar and Jain (1998), Nadkarni (1954), Seetharam *et al.* (1999), Sivarajan and Balachandran (1994), Yoganarasimhan (1996).

Barleria cristata L.

Botanical synonym

Barleria ciliata Roxb.

Common names

Bengali: jati, jhanti, sadajati; ***Hindi***: rakta-jhinti; ***Kannada***: jhinte, kuravaka, sphatikada hoovu; ***Malayalam***: karimukurunni; ***Marathi***: gokran; ***Oriya***: banpatoli, ban siriali, koilekha, obidhigohoma; ***Punjabi***: tadrelu; ***Sanskrit***: jhinti, sahacarah; ***Tamil***: nilachemulli, nila mulli, semmulli, udamulli; ***Telegu***: kodikannu, niragaranta.

Description

An erect or diffuse herb up to 1 m tall; stems appressedly hairy, densely hairy at the nodes; bracts and bracteoles spiny. Leaves elliptic-oblong to lanceolate, 6.3–13 cm long and 2.5–4.5 cm wide, acute or acuminate, hairy on both sides. Flowers bluish-purple, pink or white, pubescent outside, borne in 1–4-flowered axillary and terminal spikes; bracts lanceolate, serrate-dentate; calyx lobes 4, spinous-ciliate; corolla funnel-shaped, limb subequally 5-lobed. Fruits (capsules) 1.6 cm long, ellipsoid or oblong, acute at both ends, 4-seeded; seeds 4 mm in

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diameter, orbicular, compressed, silky-hairy. Flowers from September to November and fruits from October to January in central Indian deciduous forests.

Distribution and habitat

Found throughout India to an altitude of 2000 m in the Himalayas, commonly in the understorey of dry deciduous forests throughout peninsular India. Sometimes cultivated in gardens.

Medicinal properties and uses

In Ayurvedic medicine, it is one of several plants equated with the drug *Sahacarah*, widely used to treat neurological disorders, ulcers, glandular swellings, poisonous affections, itching, leprosy and other skin diseases, cough, oedema, toothache and gum disease. The whole plant, roots and leaves are used as a substitute for those of *Barleria prionitis* to treat inflammations, fevers, bronchitis, blood diseases, biliousness, tympanites, pains and asthma. The leaves are chewed to relieve toothache. The roots and leaves are applied to reduce swellings, and a decoction of the root is given to treat anaemia, and its infusion to relieve coughs. A decoction of the whole plant is taken in the treatment of tuberculosis among the Parharias and other tribal inhabitants of southern and eastern Bihar.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956), CSIR (1948–1992), Jha and Varma (1996), Kirtikar *et al.* (1935), Nadkarni (1954), Sivarajan and Balachandran (1994), Varma (1997), Yoganarasimhan (1996).

Barleria prionitis L.

Common names

Bengali: kantajati; ***Gujarati***: kantaasherio, kantashelio; ***Hindi***: jhinti, katsareya; ***Kannada***: kuranta, mullu goranti; ***Konkani***: gorti; ***Malayalam***: karimukurunni, shemmuli; ***Marathi***: koranta, koranti, korat, pivali koranti, vajra danti; ***Oriya***: daskerenta, dasokoranti; ***Sanskrit***: karunta, kurantaka, sahacara, sahacarah, sahachara, saireyaka; ***Tamil***: kaattukanakambaram, shemmuli; ***Telegu***: mullugoranta, mullu govinda.

Description

A much-branched, usually prickly shrub up to 3 m tall, with whitish stems and rounded branches. Leaves opposite, elliptic, acuminate, lineolate, bristle-tipped, entire, 9–18 cm long and 2.5–5.7 cm wide, glabrous above, young leaves often pubescent beneath. Flowers orange-yellow or cream-coloured, sessile, borne in axillary foliaceous bristle-tipped bracts. Fruits (capsules) ovoid, 1.8–2.5 cm long with a tapering beak, 2-seeded; seeds compressed, ovate, clothed with silky appressed hairs. Flowers from September to December and fruits from January and April in central Indian deciduous forest areas; in this region the plant is leafless from January to April or May.

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Distribution and habitat

Occurs naturally throughout the hotter parts of India in ravines and shady habitats in deciduous forests. It is commonly grown as a hedge plant in gardens and in southern India is common in disturbed, open habitats such as roadsides and wastelands.

Medicinal properties and uses

In Ayurvedic medicine, it is one of several plants equated with the drug *Sahacarah*, widely used to treat neurological disorders, ulcers, joint and glandular swellings, arthralgia, rheumatoid arthritis, poisonous affections, itching, leprosy and other skin diseases, cough, oedema, toothache and gum disease. The plant has antiseptic properties, its decoction being used as a wash in the treatment of dropsy. The leaves and flowering tops are rich in potassium salts and are valued as a diuretic. The crushed fresh leaves are used as a poultice to promote healing of wounds and to relieve rheumatic pains, scabies and itches; their infusion is also applied to the soles of the feet to harden them to tolerate extreme heat, cold and rough soil. The juice of the leaves, mixed with honey, is given to children to treat catarrh accompanied by fever and much phlegm, applied to relieve bleeding gums, and given to relieve urinary and paralytic affections and stomach disorders. A decoction of the leaves is prescribed as a gargle to relieve toothache among the Kondhs of southwestern Orissa. The leaf juice, mixed with coconut oil, is applied to facial pimples. The dried bark is given to treat whooping cough. The fresh juice expressed from the bark is diaphoretic and expectorant, and is given to treat anasarca. The roots are used as a febrifuge and the root paste is applied externally to reduce boils and glandular swellings. An extract obtained from the crushed roots is given orally in the treatment of leucorrhoea among the tribal inhabitants of central Orissa. A decoction of the roots, used as a mouthwash, is used to relieve toothache; the leaves are chewed for this purpose as well.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956), CSIR (1948–1992), Girach (1992), Kirtikar *et al.* (1935), Nadkarni (1954), Sahoo and Mudgal (1995), Sivarajan and Balachandran (1994), Yoganarasimhan (1996).

Blepharis maderaspatensis (L.) Roth

Botanical synonyms

Acanthus maderaspatensis L., *Blepharis boerhaaviifolia* Pers., *B. repens* (Vahl) Roth.

Common names

None available.

Description

A small pubescent herb with wiry prostrate stems, rooting at the nodes. Leaves in whorls of 4, unequal-sided, elliptic to obovate, 2.5–5 cm long. Flowers white, pink or pale blue with a yellow spot on the lower lip, borne solitary or in clusters of 2–3 in

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leaf axils, surrounded by white membranous bracts with green veins, the apical margins of which are furnished with hairy bristles. Fruit an ovoid capsule 0.6–0.8 cm long, 2-seeded. Flowers and fruits between September and February in central Indian deciduous forest areas.

Distribution and habitat

Common as an understorey species in shaded rocky habitats in central and southern Indian deciduous forests up to 1200 m elevation.

Medicinal properties and uses

The leaf paste, applied to the forehead, is reportedly used to relieve headaches.

References

Asolkar *et al.* (1992), Jain (1991).

Carvia callosa (Wall.) Bremek.

Botanical synonyms

Strobilanthes callosus Nees, *S. grahamianus* Wight

Common names

Gujarati: pandadi; ***Marathi***: karoi, karvi.

Description

A large aromatic shrub up to 6 m tall with rigid, rough and warted stems. Leaves unequally paired, elliptic-lanceolate, 10–23 cm long and 3.8–7.5 cm wide, apex acute or acuminate, margins crenate and ciliate, upper surface dark green and covered with cystoliths, lower surface paler and more or less hairy on the nerves beneath; petioles wing-like. Flowers light purple or deep blue, arranged in simple or branched axillary spikes with large, overlapping bracts 1.3–2 cm long, often as broad as long, broadly elliptic, rounded at apex, concave, green, viscid, with a disagreeable balsamic odour. Fruits (capsules) obovoid, 2 cm long and 0.6 cm wide, acute, apiculate, 2-seeded; seeds broadly ovate, densely clothed with white, appressed hairs. Flowering occurs gregariously once in 7–9 years, between September and November, with fruits ripening in January–February.

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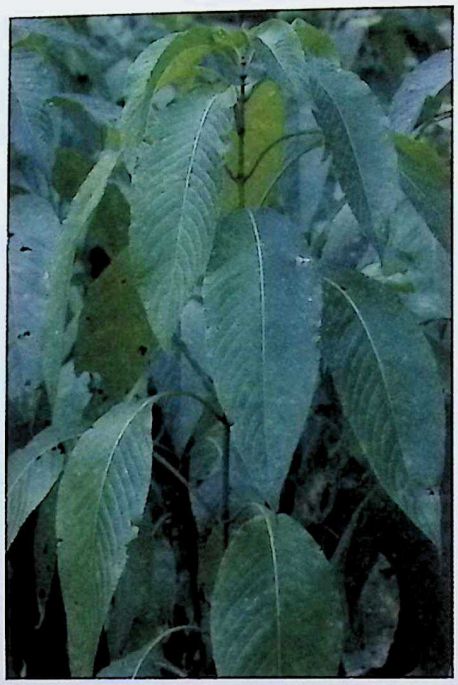
Distribution and habitat

Found in forests of Madhya Pradesh and Gujarat southwards through Maharashtra, and widely distributed throughout the Western Ghats and elsewhere in southern India between 600 and 1500 m altitude.



Medicinal properties and uses

The bark is considered to be an emollient. Its juice, mixed with the juice of *Eclipta prostrata* (*Asteraceae*), sesamum oil, black pepper and ginger, is used as an external application to treat parotitis. The flowers are used as a vulnerary; their juice, mixed with the juice of the flowers of *Catunaregam spinosa* (*Rubiaceae*), is used externally to relieve bruises.

Warning

The leaves are poisonous to humans and animals, causing vomiting and inflammation of the mucous membrane of the stomach.

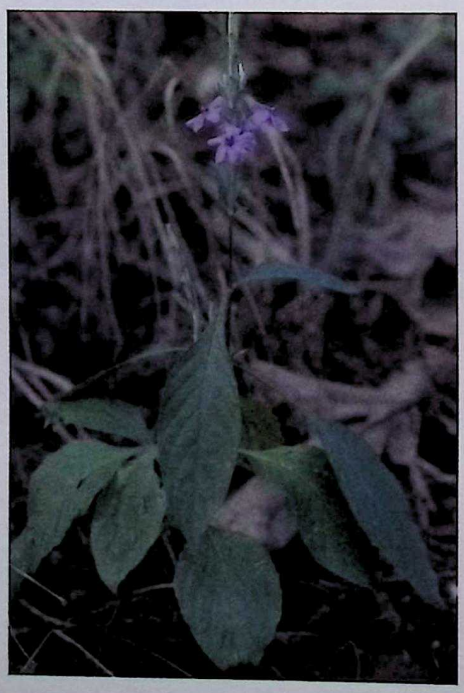
References

Asolkar *et al.* (1992), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Nadkarni (1954).

Eranthemum roseum R. Br.

Botanical synonym

Daedalacanthus roseus T. Anders.



Common names

Hindi: gulsham; ***Marathi***: dasamuli, dasmuli, gulsham; ***Tamil***: nilamulli.

Description

A shrub up to 1.8 m tall. Leaves opposite, oblong-lanceolate, acuminate, 12–20 cm long and 3.8–7.5 cm wide, lineolate on both sides, margins entire or crenulate, base tapering into petiole. Flowers blue or rose-coloured with a strong, fetid odour, borne in linear, lax, axillary and terminal spikes up to 15 cm long; bracts 1.6 cm long, obovate, white with very prominent raised green nerves. Fruit (capsule) 1.3 cm long, clavate, pointed, glabrous; seeds 3–4 mm in diameter, hygroscopically hairy,

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densely so on the margins. Flowers from November to January in central India.

Distribution and habitat

Found in moist, shaded forest habitats in the western and southern regions of peninsular India from northern Maharashtra to Karnataka and Tamilnadu.

Medicinal properties and uses

The spindle-shaped, tuberous root, boiled in milk, is a popular remedy for leucorrhoea.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Nadkarni (1954), Yoganarasimhan (1996).

Haplanthus tentaculatus Nees

Common names

Hindi: kala-kirayat, kastula; ***Marathi***: jhankara.

Description

A slender herb with quadrangular upper stems, glandular pubescent throughout. Leaves 5–10 cm long and 3–5 cm wide, ovate, more or less pubescent, apex acuminate, base tapering into the petiole; main nerves 8–10 pairs; axillary spines slender, 6–20 cm long with 2 or 3 flattened teeth at the apex. Flowers sessile; corolla blue or lilac, 1.3 cm long, in the midst of the cladodes. Fruit (capsule) oblong, pointed, 0.8 cm long, pubescent.

Distribution and habitat

Found in the upper Gangetic plain, Gujarat and in hill forests of western and central India.

Medicinal properties and uses

The plant is reportedly used as an antipyretic.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Nadkarni (1954).

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Hygrophila auriculata (K. Schum.) Heine.

Botanical synonyms

Asteracantha longifolia (L.) Nees, *Barleria auriculata* Schumach., *Hygrophila schulli* (Ham.) M.R. and S.M. Almeida, *H. spinosa* T. Anderson

Common names

Bengali: kantakalika, kuliakhara, kuliamara; ***Gujarati***: akhro, ekharo, gokhran, gokhru, talamkhan; ***Hindi***: gokhalkante, gokhula-kanta, gokshura, juliakanta, talmakhana, untkataru; ***Kannada***: kakilakshya, kalavankabija, kolavalike, kolavanke; ***Konkani***: kolista; ***Malayalam***: bahelsohulli, vayalchulli; ***Marathi***: kolsundara, nirmalli, talimakhana, vikhara; ***Punjabi***: talimkhana; ***Sanskrit***: kokilaksa, kokilaksah, kokilaksha, ikshugandha; ***Tamil***: neermulli, neremulli, nirmalli, nirumalli; ***Telegu***: kuilirakha, makheruna, neerugobbi, nirguvi-veru; ***Urdu***: neermulli.

Description

A stout herb up to 1.5 m high, more or less hispid with long hairs; stems numerous, erect, usually unbranched, subquadrangular, thickened at the nodes. Leaves in whorls of 6, the outer 2 the largest, oblong-lanceolate or oblanceolate, up to 18 cm long and 3.2 cm wide, with sharp, yellow, axillary spines; the two outer leaves of each whorl larger and others much smaller. Flowers bluish-purple, in sessile axillary whorls; calyx 4-partite, lobes unequal, clothed with soft hairs; corolla distinctly 2-lipped, the upper 2-lobed, the lower 3-lobed. Fruits (capsules) 0.8 cm long, linear-oblong, pointed, containing 4–8 orbicular seeds. Flowers between October and December in central Indian deciduous forest regions.

Distribution and habitat

Throughout the plains of India, in moist habitats such as marshy margins of canals and rice fields. Also found in tropical Himalaya, Myanmar (Burma), Indonesia and Malaysia.

Medicinal properties and uses

In Ayurveda, seeds and roots comprise the drug *Kolilaksah*, a reputed remedy for arthritis. The bitter seeds are considered aphrodisiac and tonic and are used as a uterine sedative for pregnant women, and for treating diseases of the blood and biliousness. The seeds are given with sugar or milk in the treatment of impotence, gonorrhoea and spermatorrhoea. A paste of the seeds, mixed with buttermilk or whey, is given for diarrhoea. A decoction of the root is used as a diuretic and to treat rheumatism, gonorrhoea and other diseases of the genito-urinary tract, jaundice and anasarca. The leaves are considered oleaginous, tonic, aphrodisiac and hypnotic; they are used to treat diarrhoea, dysentery, thirst, urinary calculi and urinary discharges, inflammations, biliousness, diseases of the eyes, pains, ascites and abdominal troubles, anaemia, constipation and anuria. Among the rural inhabitants of Bhavnagar District in Gujarat, the whole plant is reportedly used to treat jaundice, dropsy and rheumatism. In the Unani system, the plant is known as *Talamakhana*, the leaves being considered useful for relieving

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cough; they are applied externally to treat gleet, lumbago and joint pains. In Siddha, the flower, seeds and whole plant are used for treating anaemia, dropsy, oliguria, ascites, constipation, urinary calculi, piles and as an aphrodisiac.

References

Asolkar *et al.* (1992), Bhatt *et al.* (1999), Chopra *et al.* (1956, 1969), Girach *et al.* (1997), Kirtikar *et al.* (1935), Nadkarni (1954), Sivarajan and Balachandran (1994), Yoganarasimhan (1996).

Indoneesiella echioides (L.) Sreem.

Botanical synonyms

Andrographis echioides (L.) Nees, *Justicia echioides* L., *Neesiella echioides* (L.) Sreem.

Common names

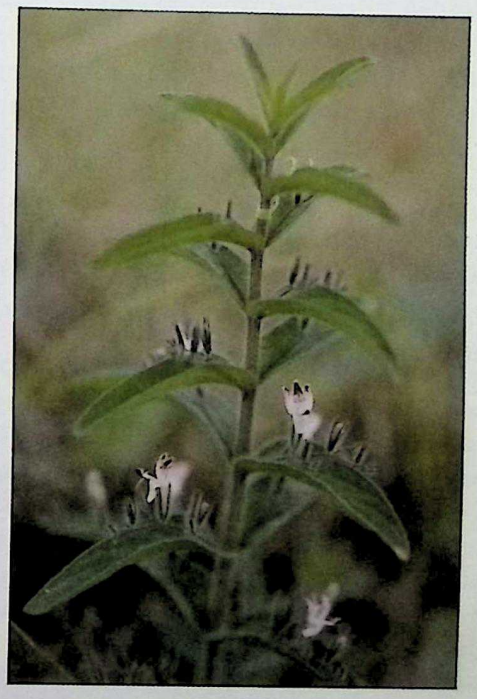
Gujarati: kalu kariyatu, kalunkariatun, kariyatu; ***Hindi***: birkubat; ***Malayalam***: gopuram thangi, pitumba; ***Marathi***: ranchimani; ***Tamil***: gopuram thangi, pitumba.

Description

An erect, annual herb up to 60 cm tall with a grooved, quadrangular stem clothed with spreading hairs. Leaves 3.2–7.5 cm long and 1–2.5 cm wide, oblong or sub-elliptic, obtuse, sparsely hairy, ciliate along margins, base cuneate. Flowers numerous, with a pink or white corolla with dark purple blotches on the lower lip, densely pubescent outside, borne along the upper side of a slender, glandular-hairy rachis, in axillary racemes; bracts 0.2 cm long, lanceolate. Fruits (capsules) 1–1.3 cm long and half as broad, compressed, acute at both ends, hairy; seeds numerous, oblong, to 2.5 mm long, not compressed, pitted, glabrous.

Distribution and habitat

Found in the drier tropical regions throughout India and in Sri Lanka; common in southern India.



Medicinal properties and uses

The plant is stated to have properties similar to those of *Andrographis paniculata* (*Acanthaceae*). The juice of the herb, or its decoction, is reportedly used to relieve fever and for treating liver disorders among the rural inhabitants of Bhavnagar District in Gujarat.

References

Asolkar *et al.* (1992), Bhatt and Mitaliya (1999), Bhatt *et al.* (1999), CSIR (1948–1992), Kirtikar *et al.* (1935), Nadkarni (1954), Yoganarasimhan (1996).

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Justicia adhatoda L.

Botanical synonyms

Adhatoda vasica Nees, *A. zeylanica* Medic.

Common names

Bengali: adulsa, bakas, vasaka; ***English***: Malabar nut, vasaka; ***Gujarati***: adsoge, adulso, aduso, aduraspi, aradusi, ardusi, bansa; ***Hindi***: adosa, adulasa, arusa, arusha, bansa, rusa, vasuka; ***Kannada***: adusoge, kurchigida, pavate; ***Konkani***: adolso, adusoge; ***Malayalam***: adalotakam, atalotakam, bushing; ***Marathi***: adulsa, adusa, bakas, vasuka; ***Oriya***: arusa, basongo, basung, rottoomuli; ***Punjabi***: bansa, basuti, bhekar, vasaka; ***Sanskrit***: shwetavasa, vasa, vasaka; ***Tamil***: adadodai, adhatodai, pavettai; ***Telegu***: adampaka, adasaramu, addasaram; ***Urdu***: arusa.

Description

A stiff, evergreen, much-branched perennial shrub with a strong, unpleasant odour, 1.2–6 m tall. Leaves opposite, elliptic-lanceolate or ovate-lanceolate, margins entire, apex acute, 5–30 cm long, hairy, light green above, dark beneath, leathery. Flowers large, white with red- or yellow-barred throats, borne in compact, axillary, penduculate spikes with large bracts. Fruits (capsules) clavate, longitudinally channelled, 1.9–2.2 cm long and 0.8 cm wide, pubescent; seeds globular. In central India flowers from December to March and fruits from January to April.

Distribution and habitat

Occurs naturally throughout India to an altitude of about 1200 m in the sub-Himalayan tract, usually gregarious in waste places, frequently near villages and often as an escape from cultivation as a hedge plant. It is more common in eastern than in western and southern India; also found in Indochina and Malaysia.

Medicinal properties and uses

The leaves, flowers, fruits and roots, taken in different forms (fresh juice, decoction, infusion and powder) are extensively used in traditional Indian medicine as an expectorant for treating colds, cough, whooping-cough, chronic bronchitis and asthma, and as a sedative, antispasmodic, and an anthelmintic. The leaves and root of this plant, administered with ginger, are considered a useful remedy for coughs. The fresh or dried leaves, sometimes mixed with stems or other aerial parts, comprise the drug *Vasaka*, well-known in traditional Indian medicine for its utility as a bronchodilator for treating bronchitis. The powdered drug is greyish-brown and has a bitter taste and characteristic odour. It is also a constituent of numerous Ayurvedic preparations and the commercial drug *Geriforte*, used to treat senile pruritis and fatigue. The powdered leaves, as well as their strong decoction, are reportedly used in the form of a poultice to relieve rheumatic joints, as a counter-irritant on inflammatory swellings, and to treat fresh wounds, urticaria and neuralgia. The leaf juice is said to cure diarrhoea, dysentery and glandular tumours, and is given as an emmenagogue. Among the tribal and rural inhabitants of Bhavnagar District in Gujarat,

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it is used to treat cough, bronchitis and tuberculosis. The flowers and fruits are considered bitter, aromatic, and antispasmodic. The flowers are sometimes prescribed to improve blood circulation and to treat ophthalmia. The roots are considered expectorant and antispasmodic, and are given to treat pulmonary and catarrhal infections. The dried powdered root, mixed with black pepper, is taken by Kondh women in southwestern Orissa to expedite childbirth. The root paste is used as an external application for treating eczema among the Munda in southern Bihar.

References

Asolkar *et al.* (1992), Bhatt and Mitaliya (1999), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Girach (1992), Katewa and Arora (1997), Kirtikar *et al.* (1935), Nadkarni (1954), Ragupathy and Mahadevan (1991), Sivarajan and Balachandran (1994), Varma (1997), Yoganarasimhan (1996).

Lepidagathis cristata Willd.

Common names

Gujarati: harancharo, paniru; ***Kannada***: gantu kaalu gedde; ***Malayalam***: karappanpundu; ***Marathi***: bhuyaterada; ***Tamil***: karappanpundu; ***Telegu***: bhuya-terada.

Description

A stiff herb with numerous procumbent, quadrangular branches arising from a hard perennial rootstock. Leaves sessile, opposite, linear-oblong or lanceolate-oblong, 2–4 cm long and 0.3–1 cm wide, lineolate above, hairy on the nerves beneath. Flowers white or pink dotted with brown or purple spots, borne in a globose head at the base of the stem; bracts 0.8 cm long, ovate, acuminate, hairy. Fruits (capsules) 0.5 cm long, ovoid, subacute, grooved on the two sides, containing 2 ovoid-oblong, rounded seeds covered with long hygroscopic mucilaginous hairs. Flowers and fruits mainly between September and April.

Distribution and habitat

Found in dry, rocky habitats from Rajasthan and Harayana southwards to Tamilnadu.

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Medicinal properties and uses

The plant is used as a bitter tonic to relieve fevers. It is also applied to the skin to relieve itches. Among the tribal inhabitants of Maharashtra, a decoction of the whole plant is used to treat measles. The ash of the dried plant is used as an external application to relieve sores in Chota Nagpur.

References

Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Nadkarni (1954), Upadhye *et al.* (1994), Yoganarasimhan (1996).

Lepidagathis trinervis Nees

Common names

Gujarati: harancharo, paniru.

Description

A small, diffuse herb with a woody rootstock; branches numerous, up to 25 cm long, slender, quadrangular, with many nodes. Leaves 2.5–4.5 cm long and 0.3–0.6 cm wide, linear, subacute, entire, 3-nerved from a slightly tapering base. Flowers densely hairy, white spotted with yellow, brown and purple, borne in axillary ovoid spikes, usually 2 or more together so as to appear like a single head; bracts up to 1.3 cm long, ovate or ovate-elliptic with a recurved spine. Fruits (capsules) 0.6 cm long, ovoid-lanceolate, compressed, 2-seeded, grooved on the sides; seeds 2.5–3 mm long, oblong, clothed with long mucilaginous hygroscopic hairs.

Distribution and habitat

Found in dry habitats in the northwestern Himalayas and from the Rajasthan desert to Chota Nagpur (in Bihar) southwards through central India and western regions of peninsular India to Tamilnadu.

Medicinal properties and uses

The plant is used as a bitter tonic. Among the tribal inhabitants of Udaipur District in Rajasthan, the root powder is taken orally to treat dysentery, and an infusion of the water-soaked leaves and roots is used to treat problems related to urination. In Bhavnagar District, Gujarat, the ash of the

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plant is mixed with oil and used as an external application to treat ringworm, swellings and eczema; in this region, a decoction of the plant is given to treat fever.

References

Bhatt *et al.* (1999), Chopra *et al.* (1956), CSIR (1948–1992), Katewa and Arora (1997), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

Peristrophe paniculata (Forssk.) Brummit

Botanical synonyms

Dianthera bicalyculata Retz., *D. paniculata* Forssk., *Peristrophe bicalyculata* (Retz.) Nees

Common names

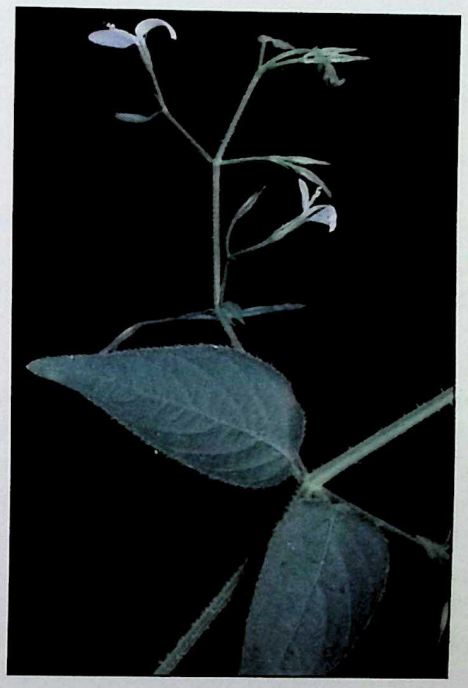
Bengali: nasabhaga; ***Gujarati***: kakjungha, kaliadhedi, kaliaghedi, kariadhedi, lasiadhedi; ***Hindi***: atrilal, itrelal, masi, nasbhanga; ***Kannada***: cheebee gida, cheebeera soppu; ***Marathi***: ghatipittapapada, rankirayat; ***Sanskrit***: kakajangha; ***Tamil***: chebira; ***Telegu***: chebira.

Description

An erect herb up to 1.8 m high with hairy, usually 6-angled, stems and branches. Leaves 5–7.5 cm long and 2.5–3.8 cm wide, ovate-acuminate, base usually rounded, more or less hairy above, densely hairy on the nerves beneath. Flowers pinkish, borne in paniculate, trichotomous cymes; bracts linear, up to 1 cm long, with white, membranous margins, glandular-hairy, paired beneath the calyx, unequal in length. Fruit (capsule) *c.* 0.8 cm long and 0.3 cm broad, pointed, narrowed into a cylindrical stalk, pubescent.

Distribution and habitat

Found almost throughout India in forests, hedges and open, disturbed habitats. Also found in Afghanistan, Myanmar (Burma) and parts of tropical Africa.



Medicinal properties and uses

In Ayurvedic practice the root is used to treat filariasis, skin diseases, worm infestation, wounds, indigestion and intermittent fever. A decoction of the plant is reportedly used as an antidote to snake poison.

References

Bhatt *et al.* (1999), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935), Nadkarni (1954), Yoganarasimhan (1996).

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Rungia pectinata (L.) Nees

Botanical synonyms

Justicia pectinata L., *Rungia parviflora* Nees var. *pectinata* (L.) C.B. Clarke

Common names

Gujarati: mothokhadsalio, moto khadsalyo; ***Sanskrit***: pindi; ***Tamil***: punakapundu, tavasumurungi; ***Telegu***: pindikunda.

Description

A much-branched, procumbent or erect herb. Leaves elliptic-lanceolate or oblong-lanceolate in moister habitats, or smaller and ovate or orbicular in arid or dry regions; base acute, usually glabrous. Flowers very small, bright blue, purple or white with blue lines, borne in short, one-sided, axillary and terminal spikes; floral bracts villous, the barren bracts prominently pectinately arranged. Fruits (capsules) ovoid, compressed, 2.5 cm long, 2- or 4-seeded; seeds orbicular, 0.5–0.8 mm in diameter, yellow.

Distribution and habitat

Found as a weed throughout the warmer parts of India, up to an altitude of about 1200 m in the Himalayas. In southern India it is common in fairly moist habitats along streams, in grassy pasture lands and in forest undergrowth to an altitude of 1200 m.

Medicinal properties and uses

The juice of the leaves is considered cooling and aperient, and is given to children suffering from smallpox. The bruised leaves are applied to contusions to relieve pain and reduce swelling. Among the Santhalis of Bihar the roots are used as a febrifuge.

References

Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Nadkarni (1954), Yoganarasimhan (1996).

Rungia repens Nees

Botanical synonym

Justicia repens L.

Common names

Gujarati: khatsalio, khatselio, khatshedio, khatshelio; ***Hindi***: kharmar, kharmor; ***Kannada***: kodagasale gida; ***Marathi***: ghatipitpapada; ***Sanskrit***: parpata, parpatakah, parpatha; ***Tamil***: kodagasalai.

Description

A spreading, decumbent herb with angular, zig-zag stems, often rooting at lower stem nodes. Leaves subsessile or with short peti-

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oles, 2.5–5 cm long and 1.3–2 cm wide, lanceolate to oblong-elliptic, base usually tapering; main nerves about 6 pairs. The leaves resemble thyme in both smell and taste. Flowers in different shades of blue, pink, ivory-white and yellow, pubescent outside, borne in axillary or terminal, imperfectly 1-sided, usually pubescent, 2.5–6.3-cm-long spikes; bracts broadly elliptic, 0.5 cm × 0.6 cm, pubescent. Fruits (capsules) ovoid-oblong, compressed; seeds suborbicular, 1.5 mm in diameter, pale brown.

Distribution and habitat

Found throughout India in the plains and low hills, usually as a weed in moist habitats such as riverbanks, ditches, channels and bunds of paddy fields.

Medicinal properties and uses

The dried, pulverized herb is used to treat cough and fever and is credited with vermifugal and diuretic properties. The fresh, bruised leaves are mixed with castor oil and applied to the scalp to cure tinea capitis, a scaly fungoid infection that usually occurs in children. In Ayurveda, the herb is used as a substitute for *Hedyotis corymbosa* (*Rubiaceae*) as a specific remedy for all types of fevers.

References

Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935), Nadkarni (1954), Sivarajan and Balachandran (1994), Yoganarasimhan (1996).

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Adiantaceae

Adiantum lunulatum L.

Botanical synonym

Adiantum philippense Burm.

Common names

Bengali: goyalelata, kalijhant; ***English***: walking maidenhair fern; ***Gujarati***: hansapadi, hansraj, mubarakha, mubarkhinipalo; ***Hindi***: hansapadi, kalijhant, paresiyavasan; ***Kannada***: navalad; ***Malayalam***: nilamparanta; ***Marathi***: ghodakhuri, ghodkhuri, hansraj, kamsaraj, ratkombada; ***Sanskrit***: hamsapadi.

Description

A small leafy fern; rhizome covered with persistent leaf bases and scales; stipes glabrous, polished, tufted, wiry, dark chestnut-brown, 6–15 cm long. Fronds simple pinnate, 15–30 cm long and 7.5 cm wide, often elongated and rooting at the apex; pinnae 10–15, stalked, ovate to lunate, minutely 5–8-lobed on the upper margin; petioles of lower pinnae 0.6–1.3 cm long, spreading. Sori transversely elongated, borne in a continuous line along the edge of each lobe.

Distribution and habitat

A graceful pantropical fern found throughout most of India to an altitude of 1200 m. Occurs in moist places on rocks and slopes of lower hills as well as on brown laterite soil or under shade near swamps.

Medicinal properties and uses

In Ayurvedic medicine the plant comprises the drug *Hamsapadi*, used as an external application to relieve burns, poisonous affections and skin diseases, including leprosy; it is also included in several important compound preparations. The fronds, made into a plaster, are applied to chronic gouty and other swellings, and to chronic tumours; the juice of the fresh plant is applied to promote healing of wounds and

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abcesses. Burnt with oil, the fronds are used as an application to soothe itches. The roots are considered carminative, tonic, diuretic and useful for treating bilious complaints; they are also prescribed for strangury and for fever due to elephantiasis. A decoction of the roots is used to treat throat infections and febrile conditions in children, and to treat discharge of blood in the urine (haematuria) among the Kondhs of southwestern Orissa, who also use the root paste as an external application to promote healing of bone fractures. In Bhadrak District, Orissa, the crushed plant is applied around the navel region to treat flatulence.

References

Chatterjee and Pakrashi (1991), Chopra *et al.* (1956), CSIR (1948–1992), Girach (1992), Girach *et al.* (1997), Kirtikar *et al.* (1935), Nadkarni (1954), Sivarajan and Balachandran (1994).

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Agavaceae

Agave cantula Roxb.

Botanical synonym

Agave americana auct. non L.

Common names

Bengali: bilati anarash, bilatipat, jungli anarash, koyan; ***English***: American aloe, century plant; ***Gujarati***: jangli kunvara; ***Hindi***: banskeora, bara kanwar, hathi-sengar, kantala, rakas-pattah; ***Kannada***: badukattalenaru, bhuttale, kalanaru, kalnaru, kaththale; ***Konkani***: reddionossi, redonossy; ***Malayalam***: panam-kattazha; ***Marathi***: ghayal, ilaitikedara, rakaspatta, vilayatikorkand; ***Oriya***: birhotokumari, kolakantolo; ***Punjabi***: wilaytikaitalu; ***Sanskrit***: kalakantala, kantala; ***Tamil***: alagai, anaikkattalai, kattukkatalai; ***Telegu***: kithanara, kittanara, rakashima talu.

Description

An erect, stemless perennial. Leaves very stout, glaucous, often with longitudinal white or yellow streaks or bands, sharply constricted into a neck just above a swollen base, margins distinctly sinuate, with mostly reflexed spines, apex with a 2.5–5-cm-long spine. Flowering stalks (scape) stout, very tall, woody. Flowers white. Fruits (capsules) oblong, beaked.

Distribution and habitat

Native to tropical and subtropical America, and introduced as an ornamental plant in

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many tropical countries between the 16th and 18th centuries. In India it appears to have been introduced in the early 18th century and has since become naturalized throughout the country, usually on open, degraded sites near villages and along roads.

Medicinal properties and uses

The juice of the leaves is used as a laxative and emmenagogue, and for treating scurvy. Among the tribal inhabitants of Surguja District in eastern Madhya Pradesh, the juice is used as an eardrop to treat earache. The roots are considered diuretic, diaphoretic and anti-syphilitic. The core of the plant is used as a febrifuge in treating malaria and other fevers, as an antiseptic, and for treating ascites, venereal sores, syphilis and dysentery. The leaves yield a strong, durable fibre used for making ropes, mats, sacking and brushes.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935), Kumar and Jain (1998), Nadkarni (1954), Yoganarasimhan (1996).

Agave wightii Drummond & Prain

Botanical synonyms

Agave angustifolia Haw., *A. ixtlioides* Hook. f.

Common names

English: dwarf aloe; ***Hindi***: khetki; ***Marathi***: chota ghayal; ***Sanskrit***: kantala; ***Tamil***: chinna erumaikkattalai, malaikkattalai, piramarakkadi; ***Telegu***: balurakkasi, kittanara, peddakalabanda, samata.

Description

A short-stemmed perennial plant. Leaves greyish-green, dagger- or sword-shaped, borne in a compact rosette, 40–60 cm long and 8 cm wide, with flat, non-decurrent spines and slender-cusped prickles. Flowers 4–5 cm, greenish, with an unpleasant odour, long-lobed, borne in few-flowered inflorescence. Fruit (capsule) strongly stipitate, beaked; seeds large.

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Distribution and habitat

Native to tropical America and introduced to India as an ornamental plant. Naturalized in the sub-Himalayan hills, outer Himalayas and throughout most of peninsular India.

Medicinal properties and uses

The roots are considered diuretic and diaphoretic. The fresh juice of the leaves is applied externally to relieve bruises.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956), Kirtikar *et al.* (1935), Nadkarni (1954).

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Aizoaceae

Trianthema portulacastrum L.

Botanical synonym

Trianthema monogyna L.

Common names

Bengali: gadabani, sabuni; ***English***: horse purslane; ***Hindi***: sabuni, salsabuni, santhi, svetsabuni; ***Kannada***: komme, muchchugoni, pasale soppu; ***Malayalam***: pasalikeera; ***Marathi***: pundharighentuli; ***Punjabi***: bishkapra; ***Sanskrit***: punarnava, varsabhu; ***Tamil***: sarvalai, shaaranaj, sharunnai, shavalai, vella-saranai; ***Telegu***: ambatimadu, galigeru, ghelijehru, tella-galigeru.

Description

A prostrate, glabrous, succulent annual herb; stems often purple-tinged. Leaves broadly obovate, cuneate at base, opposite, unequally paired, to 3.5 cm long and 3 cm wide; petiole to 1.8 cm long, expanded into a sheathing membranous base. Stipules triangular, acuminate. Flowers pink, or sometimes white, solitary, axillary, partly hidden by sheathing leaf-bases. Fruit (capsule) 0.5 cm long and 0.3 mm broad, transversely breaking into an upper coriaceous lid containing one seed and a lower membranous cup with 3–5 seeds; seeds dull black. Two forms of this species are reported: one with red stems, leaf margins and flowers; another with green stems and white flowers. Flowers and fruits during the rainy season.

Distribution and habitat

A pantropical weed native to tropical America. Found throughout India as a weed in cultivated fields and degraded sites.

Medicinal properties and uses

The roots are used in Ayurveda in external applications for treating corneal ulcers,

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itching, dimness of sight and night blindness. They are also employed as a substitute for the Ayurvedic drug *Punarnava* (from *Boerhavia diffusa*: *Nyctaginaceae*), which is used to stimulate kidney and heart function and as a specific for jaundice, diabetes, general debility, oedema and beriberi. An infusion of the roots is given internally to relieve constipation, strangury and dropsy. They are also used to treat obstruction of the liver, asthma and amenorrhoea. The powdered roots have nauseous and irritant properties and are used in combination with ginger as a cathartic and abortifacient. The leaves of the white variety are diuretic and used for treating oedema, dropsy and ascites. A decoction of the herb is used as a vermifuge, as an antidote to alcohol poisoning and for treating rheumatism.

References

Chatterjee and Pakrashi (1991), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Nadkarni (1954), Sivarajan and Balachandran (1994), Yoganarasimhan (1996).

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Alangiaceae

Alangium salvifolium (L. f.) Wangerin subsp. *salvifolium* Mukerjee

Botanical synonyms

Alangium decapetalum Lam., *A. lamarkii* Thwaites, *A. salvifolium* subsp. *decapetalum* (Lam.) Wangerin, *Grewia salvifolium* L. f.

Common names

Bengali: akarkanta, ankhura, baghankura, dhalakura; ***English***: sage-leaved alangium; ***Gujarati***: ankol, ankola, ankoli, onkla; ***Hindi***: akola, anedhera, ankol, dheri; ***Kannada***: ankola, ankole, ankule mara, ansaroli, arinjil, chemmaram, lucki; ***Malayalam***: ankolam, arinjil, azhinni, irinjil, karankolam, kimri; ***Marathi***: ankol, ankoli, ankul; ***Oriya***: ankula, ankulo, baghonokhiya, dolanku, konkonolo; ***Sanskrit***: ankola, ankota, ankotah, dirghikilaka; ***Tamil***: adigolam, alangi, alinjil, angolam, karikkolam; ***Telegu***: ankolamu, kudagu, uguda chettu, udagu, urgu; ***Urdu***: ankola.

Description

A deciduous bushy shrub or small tree up to 10 m tall, with or without spines; young branchlets often rusty-pubescent. Bark pale brown, aromatic, rough with shallow cracks, exfoliating in corky scales. Leaves alternate, narrowly elliptic or ovate, apex acute or obtuse with a pair of basal and 4–6 pairs of lateral veins, base rounded or acute, pubescent or tomentose when young, glabrous or pubescent below when full-grown, to 15 cm long. Flowers greenish-white, pubescent outside, fragrant, in axillary fascicles. Fruits (drupes) ellipsoid, black, fleshy, crowned by persistent calyx, edible. Seeds large, enclosed in red, mucilaginous, sweet but somewhat astringent pulp. Flowers from February to May and fruits from April to July in peninsular India. Two subspecies found in India are recognized: *Alangium salvifolium* subsp. *hexapetalum* (Lam.) Wang., is a climbing,

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evergreen shrub with broadly elliptic-ovate, acuminate leaves and distinct domati in axils of veins on lower surface (absent in subsp. *salvifolium*).

Distribution and habitat

Widely distributed over the plains and lower montane areas throughout most of India and elsewhere in the Old World tropics from East Africa to China, Indonesia and New Guinea. In peninsular India, usually found near streams in dry deciduous forests, along roadsides or on fallow agricultural lands near villages. *Alangium salvifolium* subsp. *hexapetalum* is restricted to wet forests of the Western Ghats within India, but is also found in East Africa.

Medicinal properties and uses

The root bark, used in the form of a decoction or powder, is very bitter and credited with antipyretic, astringent, diaphoretic, pungent, purgative and emetic properties. It is a reputed drug in Ayurveda, admistered both externally and internally for rabies and as an antidote for other poisonous bites, including snake bites; it is also used in the treatment of diarrhoea, worms, syphilis and, in the form of a paste or decoction, as an external application for leprosy, erysipelas and other skin diseases. When administered in small doses, it causes a transient drop in blood pressure followed by a sustained rise, depression of the heart and irregular respiration. It also increases the peristaltic movement of the intestines. Among the Rabari in the Barda Hills or Gujarat, a decoction of the root bark is given in the treatment of dropsy. The oil derived from the root bark is applied externally for treatment of acute rheumatism. A paste prepared from the root with the herb *Tragia involucrata* (*Euphorbiaceae*) is applied as a cure for

paralysis among the Kondhs of southwestern Orissa. A paste prepared from the root bark is used as a local application to treat snake bites, cat and dog-bites in the Gandhamardan Hills of Orissa; it is also administered orally to promote excretion of toxins. The leaves are applied as a poultice to relieve rheumatism; they are also considered hypoglycaemic. The fruits, relished by children in India, are credited with antiphlegmatic, laxative, tonic and cooling properties, and are used for treating emaciation, haemorrhages, strangury and consumption. They are also eaten to both prevent and cure eye troubles. The seeds are valued in traditional Indian medicine for their cooling and tonic properties and for their use in the treatment of haemorrhage. They are also used as a cure for boils.

References

Asolkar *et al.* (1992), Brahmam and Saxena (1990), Chatterjee and Pakrashi (1995), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Girach (1992), Jadeja (1999), Nadkarni (1954), Sivarajan and Balachandran (1994), Yoganarasimhan (1996).

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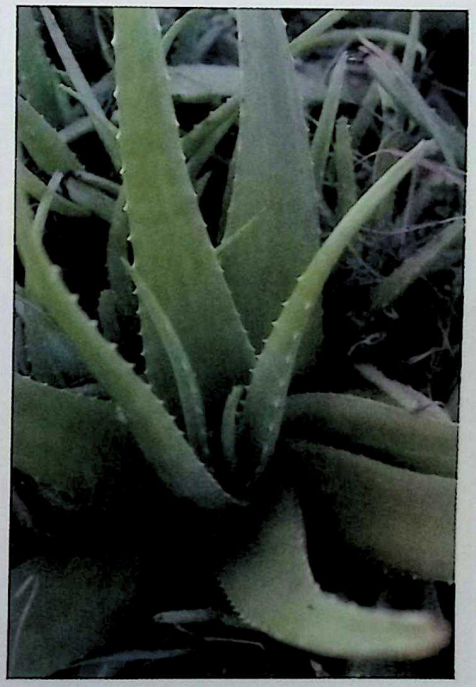
Aloaceae

Aloe barbadensis Mill.

Botanical synonyms

Aloe abyssinica Lam., *A. chinensis* Baker, *A. indica* Royle, *A. littoralis* Koenig ex Baker, *A. vera* (L.) Burm. f., *A. vulgaris* Lam., *Alpinia allhugas* Roscoe



Common names

Bengali: ghritakumari, kanya; ***English***: Barbados aloe, Indian aloe; ***Gujarati***: dadvinahani, kadvikunvar, kumarpathu, kunvar, kunwarpathu; ***Hindi***: ghikanwar, ghikumari, ghritkumari, gwarapatha, kumari, kuvarapatha; ***Kannada***: kolasoare, komarika, lolisara, maulisara; ***Malayalam***: cherukattala, ghritakumari, kattavala, kattavazha; ***Marathi***: korkand, korphad; ***Oriya***: ghikuanri, ghritokumari, kumari, mushaboro; ***Punjabi***: elwa; ***Sanskrit***: ghrita kumari, kanya, kumari; ***Tamil***: bhottukatrzhae, chirukattalai, kathalai, kattalai; ***Telegu***: chinnakata banda, kalabanda; ***Urdu***: guiqwara.

Description

A perennial herb with a short, thick stem. Leaves sessile, erect, crowded in a basal rosette, succulent, glaucous-green, 30–60 cm long, narrowly lanceolate, apex long-acuminate, smooth except for the spiny teeth on the margins. Flowers reddish-yellow, borne in dense racemes at the end of a tall, scaly, branched stalk (scape) longer than the leaves; bracts short-lanceolate, longer than the pedicel.

Distribution and habitat

Introduced to India from the American tropics and grown in gardens almost throughout the country for its commercial medicinal and cosmetic products; it is now naturalized in many parts of the country near where it has been planted.

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Medicinal properties and uses

The fresh juice obtained from the cut bases of the leaves is cathartic and cooling, and used to treat eye diseases, liver and spleen ailments, muscular pain, dermatitis, burns, cutaneous leishmaniasis and other skin problems. Throughout the world it is used in external applications to relieve burns, insect and fish bites, skin ailments, arthritis, myopathies, and in cosmetics such as hair conditioners and skin creams. Among the rural inhabitants of Bhavnagar District in Gujarat, the leaf pulp is used externally to relieve piles, boils, burns and swellings, and is considered useful for reducing unwanted depositions of body fat. The dried juice is an important ingredient of a large number of Ayurvedic preparations, particularly for treating diseases associated with the digestive system. Is also useful for treating menstrual diseases, stomach pain, for relieving constipation, and as a tonic after pregnancy. The root is reportedly used to treat colic. The leaves and flowers are eaten after pickling in Gujarat. The leaves yield a useful fibre, and a dye prepared from the plant imparts a purple colour to silk, black to wool and pink to linen.

References

Asolkar *et al.* (1992), Bhatt and Mitaliya (1999), Bhatt *et al.* (1999), Chopra *et al.* (1956), CSIR (1948–1992), Girach and Aminuddin (1995), Kirtikar *et al.* (1935), Nadkarni (1954), Yoganarasimhan (1996).

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Amaranthaceae

Achyranthes aspera L.

Common names

Bengali: apang, chirchiti; ***English***: prickly chaff-flower; ***Gujarati***: agheda, aghedi, aghedo, anghedo, safed aghedo; ***Hindi***: apang, chichida, chirchira, chirchitta, latjira; ***Kannada***: utranigida, uttaraanne, uttaranee, uttrane; ***Konkani***: kantmogro, uttarani; ***Malayalam***: kadaladi, katalati; ***Marathi***: aghada, aghara, pandhara-aghada; ***Oriya***: apamaranga, apamargo; ***Punjabi***: chichra, kutri; ***Sanskrit***: apamarga, apamargah, kharamanjari; ***Tamil***: chirukadaladi, nagarasi, nayurivin nayuruvi; ***Telegu***: antisha, apamargamu, uttareni.

Description

An erect or procumbent, annual or perennial herb with spreading branches, usually up to 1 m tall, often with a woody base; stems angular, ribbed, pubescent, simple or branched from the base, often reddish-purplish tinged. Leaves opposite, thick, ovate-elliptic or obovate-rounded, but variable in shape and size, 4–12 cm long and up to 8 cm wide, velvety-tomentose. Flowers greenish-white, numerous, in axillary or terminal spikes up to 75 cm long; bracts membraneous, persistent. Fruit membranous, oblong, enclosed in the hardened perianth. Seeds reddish-brown, sub-cylindrical, truncate at the apex, rounded at the base. Flowers from November to January in central Indian deciduous forest areas.

Distribution and habitat

Pantropical in distribution, it is found as a weed in pastures, wastelands and roadsides throughout India up to 900 m altitude.

Medicinal properties and uses

The plant is considered pungent, astringent, pectoral and diuretic. The dried plant is used as a laxative, and is reportedly useful for treating gonorrhoea and colic. A decoction of the whole plant is diuretic and

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reportedly useful for treating renal dropsy; in large doses, however, it acts as an ecbolic. The juice of the plant is reportedly used to treat ophthalmia and dysentery. The ash of the whole plant is reportedly applied to the whole body before bathing as a treatment for jaundice among the Gonds of Uttar Pradesh. The leaves are made into a paste with water and applied to relieve bites of poisonous insects, bees and wasps. A decoction of the powdered leaves with honey is reportedly useful in the early stages of diarrhoea and dysentery. In northeastern Karnataka, the leaves, crushed with betel (*Piper betle*: *Piperaceae*) leaves, are applied as a paste to relieve rheumatic pain; the leaf paste is also applied externally to promote healing of cracked skin on the feet and, along with the leaf paste of *Abutilon indicum* (*Malvaceae*) and *Azadirachta indica* (*Meliaceae*), it is used externally to cure ulcers. In this region and in the Bhavnagar District in Gujarat, the leaf juice is used as an eardrop to relieve ear pain. The astringent roots are applied to wounds as a haemostatic and their paste is applied to clear opacity of the cornea; among the Rabaris in the Barda Hills of Gujarat, the dried root powder is reportedly given to treat night blindness. Root infusions are given as a mild astringent for treating bowel complaints. A decoction of the roots is used to relieve diarrhoea, and an aqueous extract for treating bladder stones. A pinch of the powdered root mixed with an equal amount of black pepper is given with honey as a remedy for coughs. The powdered root, mixed with honey, is taken internally to relieve haemorrhoids; mixed with water it is used to restore consciousness in epileptic conditions by the Bondo tribals in southern Orissa. Among the rural inhabitants of Bhavnagar District in Gujarat, the roots, are reportedly used to increase menses and facilitate childbirth. A paste made from the roots with buttermilk is taken internally as an antifertility drug by tribal women in Bastar (Madhya Pradesh). The pounded roots, mixed with those of *Diospyros melanoxylon* (*Ebenaceae*) and water, are given for treatment of fever among the tribal inhabitants of southern Bihar. The flowers, ground and mixed with curd (yoghurt) and sugar, are used as a medicine for menorrhagia; the flower-tops are reportedly used for treating rabies. The powdered seeds are soaked in buttermilk and given for relief of biliousness; they are also used to treat haemorrhoids among the Santhalis in southern Bihar. The seeds are also used as an expectorant and emetic; rubbed with rice water, they are given to relieve bleeding piles.

References

Aminuddin and Girach (1991), Asolkar *et al.* (1992), Bhatt and Mitaliya (1999), Bhatt *et al.* (1999), Chatterjee and Pakrashi (1991), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Girach and Aminuddin (1995), Hemadri and Rao (1989), Jadeja (1999), Kirtikar *et al.* (1935), Nadkarni (1954), Seetharam *et al.* (1999), Singh and Prakash (1994), Sivarajan and Balachandran (1994), Yoganarasimhan (1996).

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Aerva lanata (L.) Juss. ex Schult.

Botanical synonyms

Achyranthes lanata L., *Aerva elegans* Moq., *Illecebrum lanatum* (L.) Murr.

Common names

Bengali: chaya; ***English***: polpala; ***Gujarati***: bur, gorakha ganjo, kapurimadhuri; ***Hindi***: chaya, kapurijadi, gorkhabundi, papurijadi; ***Kannada***: bilihindi soppu; ***Malayalam***: cherula, cherupula; ***Marathi***: kapurimadhuri, kapurmadhura, kumrapindi; ***Oriya***: paunsia; ***Punjabi***: buikallan; ***Sanskrit***: astamabayda, bhadra; ***Tamil***: pulai, sirupulai; ***Telegu***: pindichettu, pindiconda, pindikumda.

Description

A generally prostrate herb with woolly branches arising from a woody base. Leaves simple, alternate, short-petioled, elliptic-orbicular to obovate, 1.3–3.5 cm long and 0.8–2.5 cm wide, gradually smaller toward apices, glabrate or finely pubescent above, white woolly beneath. Flowers minute, sessile, greenish- or creamy-white, borne in axillary spikes, usually 3–4 together. Fruit ovoid, acute; seeds black, bean-shaped. Flowers and fruits from September to March.

Distribution and habitat

A common weed found throughout India up to 900 m elevation. Widespread in drier regions of the Old World tropics and subtropics.

Medicinal properties and uses

The plant is considered anthelmintic and demulcent and is used to treat lithiasis, cough, sore throat, indigestion, wounds and as a specific for diabetes. The whole plant is widely used in Rajasthan to treat skin affections. In Bihar, the plant is used to treat diarrhoea, cholera and dysentery. The decoction of the plant is used as a diuretic; its infusion is given to reduce fever among the Paharia in southern Bihar. Among the tribal inhabitants of south-central Andhra Pradesh, the leaf juice is given to expel kidney stones. The roots are also diuretic and demulcent, and are credited with tonic properties; they are used to treat strangury in Ayurveda. In southern Orissa a decoction prepared by boiling the roots, along with the tuberous roots of *Cyperus rotundus* (*Cyperaceae*) and fennel seed (*Foeniculum vulgare*: *Umbelliferae*) is given to treat diarrhoea in children. Among the Rabaris in the Barda Hills of Gujarat, the ground root is given with curd (yoghurt) for treating jaundice. The roots and flowers are used to relieve headache. The flowers are reportedly useful for dissolving kidney stones, treating gonorrhoea and, in combination with other herbs, for conjunctivitis.

References

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Alternanthera pungens H.B.K.

Botanical synonym

Alternanthera repens (L.) Link

Common names

English: khaki weed; ***Kannada***: mullu honagonne.

Description

A branched, prostrate herb. Leaves broadly ovate, elliptic or oblanceolate, 3–6 cm long and 2–8 cm wide. Flowers with spiny bracts and bracteoles, borne in axillary and terminal heads.

Distribution and habitat

Native to tropical America and now pantropical. In India, it is found as a weed in dry, open habitats such as roadsides and wastelands, usually on sandy, rocky soils.

Medicinal properties and uses

The plant is said to possess diuretic properties. Its decoction is reportedly taken to treat gonorrhoea.

References

Asolkar *et al.* (1992), CSIR (1948–1992), Yoganarasimhan (1996).

Alternanthera sessilis (L.) R. Br. ex DC.

Botanical synonyms

Alternanthera nodiflora R. Br., *A. triandra* Lam., *Gomphrena sessilis* L.

Common names

Bengali: sanchi; ***Gujarati***: jalajambo, paninibhaji; ***Hindi***: kanchari; ***Kannada***: honagonne; ***Malayalam***: ponnagannikeeray; ***Marathi***: kanchari; ***Sanskrit***: giojihra, matsyaksi; ***Tamil***: ponnagannikkirai; ***Telegu***: ponnagantakura, ponnagantikura.

Description

A prostrate or procumbent, annual or perennial herb; branches arising from the root, up to 50 cm long, often purplish, glabrous, the ultimate ones with two opposite lines of hairs, branch nodes often villous. Leaves opposite, fleshy, generally 1.3–3 cm long and 0.5–1 cm wide (larger in wet habitats), linear-elliptic, oblong or obovate, apex rounded, base cuneate. Flowers inconspicuous, white, borne in small, axillary heads; bracts ovate or obovate, 1 mm long; bracteoles shorter, persistent; tepals 5, subequal, ovate, acute. Utricle cordiform, strongly compressed; seeds orbicular. Flowers and fruits throughout the year.

Distribution and habitat

Widely distributed throughout the Old World tropics. In India it is found as a weed across a range of open site condi-

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tions, though preferring moister habitats, throughout the warmer parts of the country to an altitude of 1200 m in the Himalayas. It is sometimes cultivated for its edible young shoots and leaves.

Medicinal properties and uses

The whole plant is one of three sources of the Ayurvedic drug *Lonika*, used to treat wounds, flatulence, cough, bronchitis and diabetes; it is also an ingredient of several compound Ayurvedic preparations. It is reportedly used in parts of Bihar to treat night blindness. A poultice of the herb is reportedly useful to promote the healing of boils. The leaves and stems are used as a galactagogue and febrifuge. The young shoots and leaves are considered useful for relieving indigestion and are eaten as a cooked vegetable or in soups. The roots are applied externally to relieve inflamed wounds. Among the Santhalis and Paharia in eastern Bihar, an extract of the roots, crushed with the bark of *Alstonia scholaris* (*Apocynaceae*), is taken with cow's milk to treat spermatorrhoea.

References

Asolkar *et al.* (1992), Chatterjee and Pakrashi (1991), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Kumar and Goel (1998), Nadkarni (1954), Sivarajan and Balachandran (1994), Yoganarasimhan (1996).

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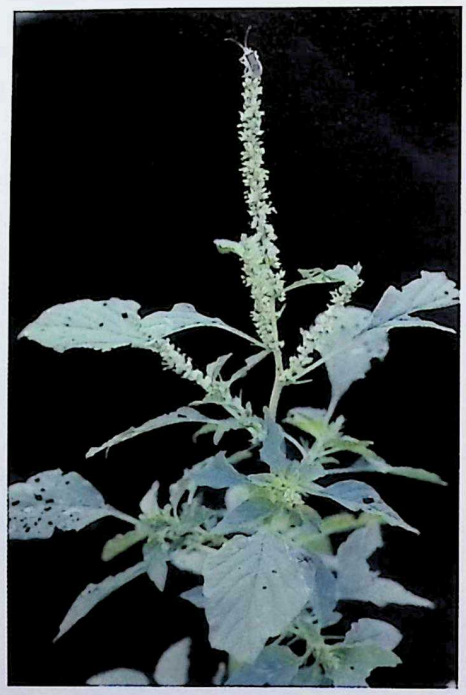
Amaranthus spinosus L.



Common names

Bengali: kantamaris, kantanote; ***English***: prickly amaranth, spiny pigweed, thorny amaranth; ***Gujarati***: kantalo dambho, kantalo dhimdo, kantanu dant, tandaljo; ***Hindi***: choli, janumarak, kantabhaji, kantanatia, kanta nutiya, katailichaulai; ***Kannada***: mulladantu, mulluharivesoppu, mullukiresoppu; ***Konkani***: dentto; ***Malayalam***: mullanchira, ceruchira; ***Marathi***: chanalai, kantebhaji, kante math, tandulja; ***Oriya***: kantamarisha, kantaneutia; ***Sanskrit***: alpamarisha, marish, tandula, tanduliya; ***Tamil***: mud-keerai, mullukkirai; ***Telegu***: ettamulugoranta, mullatotakura, mundla kura.

Description

An erect, branched, annual or perennial herb, varying in colour from green to purple, 30–60 cm tall with hard, straight, paired axillary spines. Leaves long-petioled, oblong, ovate-elliptic or lanceolate, acute or obtuse, base cuneate, generally 1–6 cm long and 0.5–2.6 cm wide. Flowers minute, greyish-green, borne in dense axillary clusters or terminal spikes; bracts and bracteoles narrowly ovate-lanceolate. Fruit dehiscent; seeds oblong, black, compressed, shining. Flowers and fruits throughout the year.

Distribution and habitat

A pantropical and subtropical weed native to tropical America. In India it is often cultivated and is very common in disturbed, open habitats such as cultivated fields and roadsides throughout the country.

Medicinal properties and uses

The plant is considered diuretic, emollient, sudorific and febrifuge, and is recommended for treating eruptive fevers, as a galactagogue and as a remedy for colic. A decoction of the plant is considered useful for improving digestion. The leaves are applied as a poultice to relieve bruises, abscesses, burns, wounds and inflammations; their infusion is used as a diuretic. The root is used to treat menorrhagia, gonorrhoea, eczema and inflammatory swellings. The powdered root is used as a cure for paronychia. The roots and leaves are boiled and given to children as a laxative. Among the Santhalis and Paharia in eastern Bihar, the root extract is given as a vermicide. In southern Orissa, however, an aqueous decoction of the root is given to check chronic diarrhoea. In Ayurvedic practice the root is used to treat uterine diseases.

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Celosia argentea L.

Common names

Bengali: safed-morugphul, swetmurgha; ***English***: quail grass, silver-spiked cockscomb; ***Gujarati***: lambadi, lapadi; ***Hindi***: debkoti, sarwani, sarwari, sufaid murga, survari; ***Kannada***: anne soppu; ***Konkani***: kurdu, kurduqui bagi; ***Malayalam***: ceruchira; ***Marathi***: kurada, kurdu; ***Oriya***: gangachulia; ***Punjabi***: chilchil, sarpankha, sarwali; ***Sanskrit***: vitunna; ***Tamil***: panna, pannakeerai; ***Telegu***: gulugkura, gurugu, panchechettu; ***Urdu***: sarwali.

Description

An erect annual herb up to 1 m tall with angular stems and grooved branches. Leaves linear-lanceolate to elliptic-lanceolate, acuminate, narrowed at the base, entire, up to 12 cm long and 4 cm wide. Flowers white or pink, glistening, borne in feathery, conical to cylindrical spikes. Fruits are membranous utricles containing 4–8 black, shining seeds. Flowers and fruits during the winter, October–February, in most parts of India.

Distribution and habitat

Pantropical in distribution, it is found in open habitats such as fallow fields, river-banks and grasslands throughout most of India to an altitude of 1500 m in the Himalayas.

Medicinal properties and uses

The seeds are considered to be aphrodisiac and vulnerary; they are used to treat diarrhoea, diseases of the blood, and mouth sores in Unani medicine. The oil extracted from the seeds, mixed with milk and sugar, is used by tribal people in some parts of India as a tonic. In Ayurveda, the seeds are used as a substitute for those of *Celosia argentea* var. *cristata* to treat urinary calculi, dysuria, cough, worm infestation and eye diseases.

References

Asolkar *et al.* (1992), Chatterjee and Pakrashi (1991), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Sivarajan and Balachandran (1994), Yoganarasimhan (1996).

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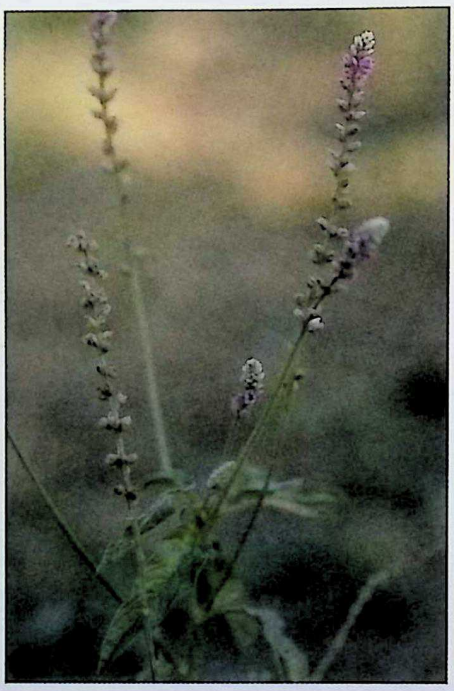
Digera muricata (L.) Mart.



Botanical synonyms

Achyranthes muricata L., *Digera arvensis* Forssk., *Desmochaeta muricata* DC.

Common names

Bengali: gungatiyaluta, mahawria; ***Gujarati***: kanajaro; ***Hindi***: latmahuria, lisava; ***Kannada***: cancali soppu, chenchali soppu; ***Marathi***: gitana; ***Punjabi***: leswa, tandala, tartara; ***Sanskrit***: aranyavastuka, kunanjara, manjirika; ***Tamil***: thoyyakeerai; ***Telegu***: chanchali kura, chenchalikura.

Description

An annual herb, 30–60 cm high, with spreading branches. Leaves variable, 2–7.5 cm long and 1.3–4.5 cm wide, ovate or elliptic, acute or rounded at the apex, sometimes with reddish margins, glabrous; petioles 1.3–2.5 cm long. Flowers pink, borne in threes in lax, axillary, pedunculate spikes 2.5–12.5 cm long; bracts and bracteoles persistent. Fruit globose, approximately 0.3 cm in diameter; seeds yellowish-brown.

Distribution and habitat

Found as a common weed in pastures, cultivated fields and wastelands almost throughout India. Its native range extends from Arabia to Indonesia.

Medicinal properties and uses

In Ayurveda the herb is considered cooling, astringent to the bowels at first, but laxative in large doses. The flowers and seeds are used to treat urinary discharges.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

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Amaryllidaceae

Crinum viviparum (Lam.) Hemadri

Botanical synonym

Crinum defixum Ker.-Gawl.

Common names

Bengali: sukdarshan; ***Gujarati***: nagrikand; ***Kannada***: kaadu eerulli; ***Sanskrit***: kandali; ***Telegu***: kesarchettu.

Description

An erect herb with large globose or oblong bulbs 7.5–10 cm in diameter. Leaves few or many, 60–90 cm long and 2–4 cm wide, linear, concave or channelled, thick, margins slightly rough, apex acute or obtuse. Flowers white to reddish, borne in 6–15-flowered umbels on a 45–75-cm-long, cylindrical stalk, with 2 oblong-lanceolate bracts 3.8–5 cm long; perianth tube 6–13 cm long, cylindrical, segments nearly as long, narrowly linear-lanceolate, reflexed or drooping, filaments shorter than perianth segments, spreading, bright red. Fruit subglobose, 2.5 cm in diameter, short-stalked, beaked by the perianth tube; seeds rugose.

Distribution and habitat

Found in wet habitats along riverbanks throughout India and Sri Lanka, most commonly in West Bengal and in peninsular India up to 900 m elevation; often cultivated in gardens.

Medicinal properties and uses

The bulb is considered emollient and emetic, and is used in small doses as a nauseant and diaphoretic. The juice of the leaves is reportedly used as an eardrop to treat otitis. The bulb is used in Madagascar both internally and externally to treat burns, whitlow and carbuncles. In Ayurveda, the

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leaf, rhizome and corm are used as a substitute for those of *Crinum latifolium* to treat gout, oedema, leprosy and fever. In Siddha the leaves are used to treat dropsy, earache, carbuncles and paronychia.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956, 1969), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

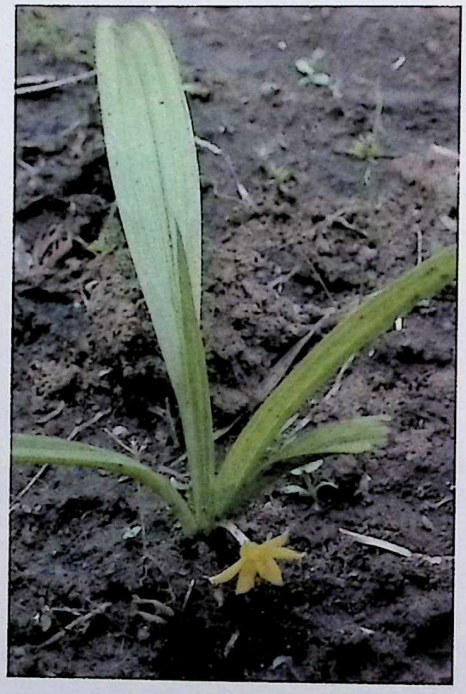
Curculigo orchioides Gaertn.

Botanical synonyms

Curculigo malabarica Wight, *Hypoxis orchioides* Kurz

Common names

Bengali: sadamusli, talamuli, talusa; ***English***: black musale; ***Gujarati***: kalimusli; ***Hindi***: kalimusli, kali musri, mushali, muslikand, siyahmusli; ***Kannada***: neladali, nelatatigadde, nela tengu; ***Konkani***: bhuyimaddi; ***Malayalam***: nellapanakilongu, nelappanakizhanna, nilappana (rhizome); ***Marathi***: bhuyimaddi, kalimusali; ***Oriya***: musali; ***Sanskrit***: musali, talamuli; ***Tamil***: nilappanaikkilhangu, nilappanaikkizhangu; ***Telegu***: nalla-tadi, nallatadigudda, nelatadi, nelatigaddalu; ***Urdu***: musali.



Description

A small, perennial herb with a long, stout, cylindrical rootstock and copious fleshy root fibres. Leaves arising from the base, 15–45 cm long and 1.3–2.5 cm wide, linear or linear-lanceolate, smooth or sparsely hairy, plicate, apex acute, often bearing bulbils. Flowers small, bright yellow, star-shaped, borne on very short flattened scapes (stalks) just above the ground, hidden in the leaf sheath. Fruit (capsule) hypogeous, 1.3 cm long, 1–4-seeded; seeds oblong, black, shiny, deeply grooved with wavy lines. In central India the plant appears during the rainy season, flowers between June and August and dies down during the cold season.

Distribution and habitat

Native to subtropical and tropical Asia from India to Malesia.[1] In India it occurs in the subtropical Himalayas from Kumaon (Uttar Pradesh) eastwards to Assam and in western regions of peninsular India from Konkan (Maharashtra) southwards to an altitude of about 2400 m, on marshy sites, in rock crevices and on lateritic soils.

Medicinal properties and uses

In Ayurvedic medicine the rhizome (tuberous root) is a reputed rejuvenative drug; it is considered bitter, sweet, demulcent, diuretic,

[1] Malesia is a phytogeographical region comprising Malaysia, Indonesia, New Guinea, the Philippines and Brunei.

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tonic and aphrodisiac. It is used in the treatment of sprue, piles, blood disorders, as a tonic, and in the form of a poultice for treating skin diseases and relieving itches. The powdered rhizome is reportedly taken with milk to treat impotence. In Unani, it is also used as an aphrodisiac and for treating diabetes, leucoderma and wasting diseases. The dried, powdered or fresh, crushed rhizome is applied to promote healing of cuts and wounds. A decoction of the pounded rhizome along with crushed *ajwain* (fruits of *Trachyspermum ammi*: *Umbelliferae*) is reportedly given to unconscious children. Among the Bondos of southern Orissa, the root paste, mixed with salt, is applied externally to relieve boils. In combination with aromatics and bitters it is also used to treat piles, jaundice, asthma and diarrhoea. Among the tribal inhabitants of eastern Bihar, the dried, powdered tuber is given orally for treating leucorrhoea, and the chewing of one tuber daily is said to prevent diarrhoea.

References

Aminuddin and Girach (1991), Asolkar *et al.* (1992), Chopra *et al.* (1956), Jha and Varma (1996), Kirtikar *et al.* (1935), Nadkarni (1954), Sivarajan and Balachandran (1994), Varma (1997), Yoganarasimhan (1996).

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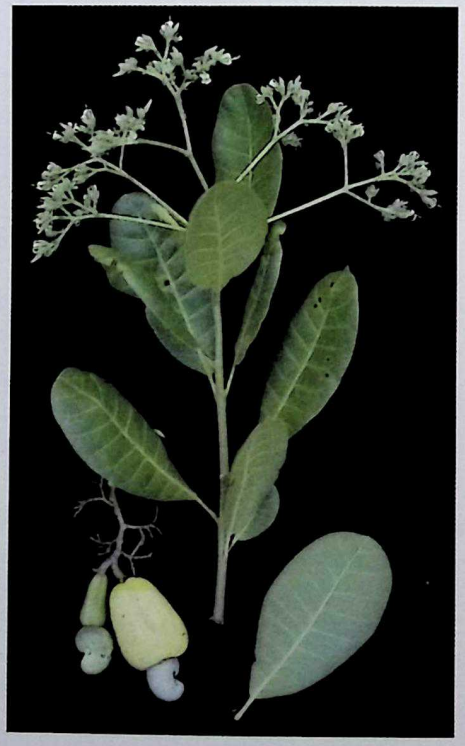
Anacardiaceae

Anacardium occidentale L.

Common names

Bengali: hajli-badam, higli-badam, kaju; ***English***: cashew; ***Gujarati***: kaju; ***Hindi***: kaju, kajubadam; ***Kannada***: gera-bija, godambe, godambi mara, jidi-vate, kempu geru bija; ***Konkani***: kaju, kazu; ***Malayalam***: andiparuppu (kernel), kashumavu (tree), kashunandi, kashuvandi (nut), paranki mavu, paringi mavu; ***Marathi***: kaju, kajuchabi; ***Oriya***: bholliaambo, hijilabodamo, lonkabhollia; ***Sanskrit***: kajutaka; ***Tamil***: kola mavu, mundhiri-kai, mundhiri kottai; ***Telegu***: jidianti, jidimamidivittu, mokkamamidi, munthamamidivittu.



Description

A small, spreading evergreen tree, sometimes reaching a height of 12 m. Leaves obovate or obovate-oblong, coriaceous, glabrous, apex obtuse-retuse or rounded, base cuneate, 6–15 cm long and 5–8 cm wide, somewhat crowded at the ends of twigs. Flowers small, yellow, with pink stripes, borne in 15–25-cm-long terminal panicles, with both staminate and hermaphrodite flowers. Fruit a kidney-shaped nut, 2.5 cm long, borne on a 5–7.5-cm-long, pyriform, fleshy receptacle, the cashew apple, having a thin, bright yellow to scarlet skin and soft, juicy flesh. The nut is greyish-green with a hard, smooth and shining oleaginous pericarp enclosing a curved, white kernel covered with a thin, reddish-brown testa.

Distribution and habitat

Native to northeastern Brazil, and introduced to India during the latter half of the 16th century by the Portuguese. Now cultivated (for its kernel, or 'nut') as a major export crop in Maharastra, Goa, Karnataka, Kerala, Tamilnadu, Andhra Pradesh, Orissa

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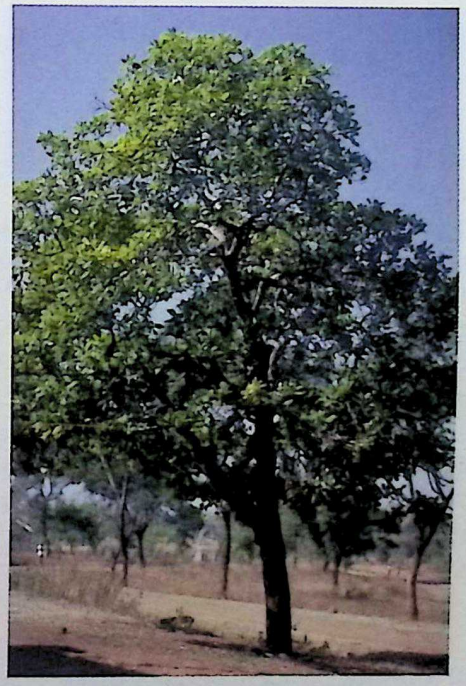
and West Bengal, with its cultivation concentrated in the coastal areas of the country. In many areas it has become naturalized.



Medicinal properties and uses

The delicious, nutritious cashew kernel is eaten as a dessert and is an important item of confectionery, used raw, roasted or fried and salted. The juicy, pleasantly aromatic, cashew apple (receptacle) has a sweet, slightly astringent taste when ripe, and is eaten raw, fermented to make wine or brandy, or is used for making juice, syrup, confectionery and pickle after removing the astringent principle. The cashew apple as well as the juice possesses antidiarrhoeal and antiscorbutic properties. The fermented juice is valued as a diuretic and is useful for treating kidney troubles and advanced cases of cholera. The resinous juice contained in the seeds is used to treat cases of mental derangement, sexual debility, morning sickness, heart palpitations, rheumatic pericarditis, and loss of memory following recovery from smallpox. The kernel is considered a good food for weak patients suffering from incessant and chronic vomiting. Oil extracted from the cashew nut shell is used as a mosquito larvicide, is a mild purgative and is also used in the treatment of hookworm and for the treatment of cracks on soles of feet, warts, corns and leprous sores. The bark is alterative and astringent; bark extracts reportedly possess antihypertensive properties and can lower blood sugar when taken orally. Tar obtained from the bark is applied externally to treat leprosy, corns, ulcers, as a counter-irritant and rubefacient and vesicant. The root possesses purgative properties.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935), Nadkarni (1954), Yoganarasimhan (1996).

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Buchanania lanzan Spreng.

Botanical synonym

Buchanania latifolia Roxb.

Common names

Bengali: chironji, piyal; ***English***: almondette tree, cheronjee, cuddapah almond; ***Gujarati***: charoli; ***Hindi***: achar, chironji, piyal, piyar; ***Kannada***: mukrali, nurkale, nurkul; ***Malayalam***: kalamavu, munga pera, nuruvi; ***Marathi***: char, charoli, chironji; ***Oriya***: charu, priyalo; ***Punjabi***: chiroli, chironji; ***Sanskrit***: chara, piyala, priyala, priyalah; ***Tamil***: ayma, morala, mudaikkai, mudaima; ***Telegu***: chara, morli, morlu chettu, sara; ***Urdu***: chironji.

Description

An evergreen tree with a straight, cylindrical trunk up to 15 m tall with rough, dark grey bark. Branches tomentose when young. Leaves thickly coriaceous, pubescent beneath, broadly oblong, obtuse, with rounded base. Flowers small, greenish-white, in axillary and terminal panicles. Fruits (drupes) ovoid or globose, black, 8–12 mm in diameter; stones hard. Flowers from January to February and fruits from April to May; trees leafless for a short time during the dry season (April–June) in central Indian deciduous forests.

Distribution and habitat

Native to tropical Asia from India and Myanmar (Burma) to southern China, Indochina and Thailand. Commonly found in dry deciduous forests throughout India, up to an altitude of 900 m. A common sub-canopy associate in sal (*Shorea robusta*)-dominated forests.

Medicinal properties and uses

The edible seed kernels have a pleasant, slightly acidic flavour, and are eaten raw or roasted. An ointment made from the kernels is used to relieve itch and prickly heat, and to remove facial blemishes. The seed oil is used to reduce glandular swellings of the neck and as a substitute for almond oil in traditional medicinal preparations. The gum exuded from the cut bark is used to treat diarrhoea and, mixed with goat's milk, intercostal pains. The stem bark, powdered together with that of *Syzygium cumini* (*Myrtaceae*), is given to treat infantile diarrhoea among the tribal inhabitants of southern Bihar. In Andhra Pradesh, the gum, dissolved in cow's milk, is used internally to

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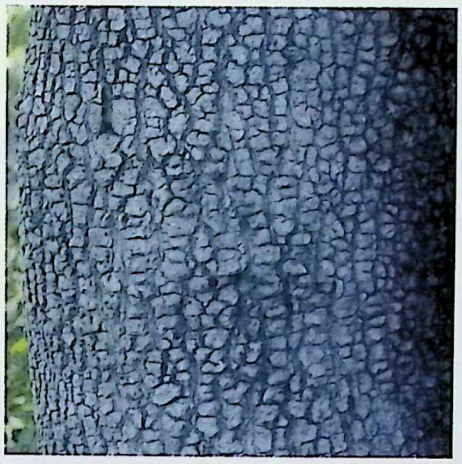
treat rheumatic pains. The leaves are reportedly valued for their tonic and cardiotonic properties, and their powder is a common medicine to promote the healing of wounds. The roots and leaves, pounded and mixed with buttermilk, are given for diarrhoea.



References

Asolkar *et al.* (1992), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Girach and Aminuddin (1995), Kirtikar *et al.* (1935), Nadkarni (1954), Yoganarasimhan (1996).

Holigarna arnottiana Hook. f.

Botanical synonym

Holigarna longifolia Wight & Arn.

Common names

Kannada: holageru, holigar, hulgeri, kadugeru, katugeri; ***Malayalam***: charei, chera, cheru, kattuchera; ***Marathi***: bibu, holgeri, sudrabilo; ***Tamil***: karumcharei, karunjarai, kattucheram, kattucheru.

Description

A tall deciduous tree, often with a buttressed bole; branchlets densely leafy at the apex. Leaves alternate, obovate or oblanceolate, 15–30 cm long and 5–10 cm wide, glabrous, apex acute or rounded, base decurrent into the petiole; main nerves 12–20 pairs, prominent on both surfaces; petiole 0.6–2.5 cm long, with two petiolar spurs or tubercles at the top. Flowers minute, polygamous or unisexual, crowded in rufous-tomentose axillary and terminal panicles; calyx-teeth very short; petals 2.5 mm long, oblong, acute. Fruit (drupe) up to 2.5 cm long, obliquely ovoid, rounded at the top, glabrous, long-pedicelled, almost entirely included in the torus.

Distribution and habitat

Found in the evergreen forests of the western coastal areas of peninsular India and in the Western Ghats from the Konkan southwards; its best development occurs on deep, moist, fertile soils.

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Medicinal properties and uses

The juice from the fruits is used as a vesicant, and the fruit and bark are reportedly also used in traditional medicine.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956), Kirtikar *et al.* (1935).

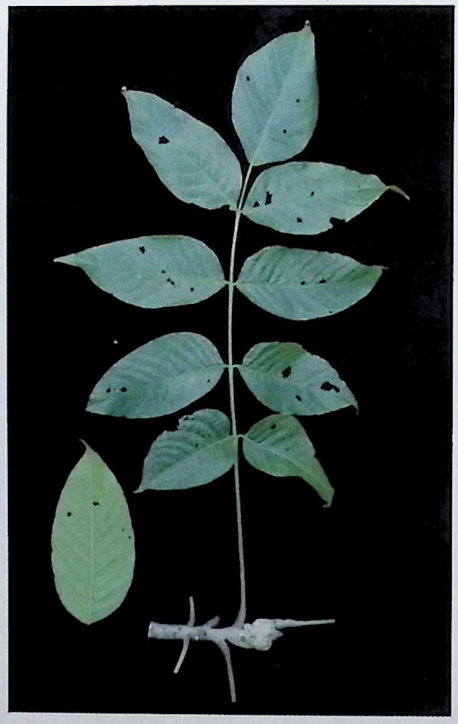
Lannea coromandelica (Houtt.) Merrill

Botanical synonyms

Dialium coromandelicum Houtt., *Haberlia grandis* Dennst., *Lannea grandis* (Dennst.) Engler, *Odina pinnata* Rottl., *O. wodier* Roxb.

Common names

Bengali: bhadi, jeol, jiol, jiyal; ***Gujarati***: indramati, mavedi, moi; ***Hindi***: jhingan, jingan, kaimil, mohi, mohin, mohni, moyen, thingan; ***Kannada***: ajasringi, kuratige, godda, gojal, udi mara; ***Konkani***: moi, muya; ***Malayalam***: anakkaram, kalasan, kalayasam, odiya maram, oti; ***Marathi***: moi, munidi, shimat, shimti; ***Oriya***: gongoromohi, indramai, indramohi, jiyolo, mohi, moi; ***Punjabi***: batrin, dhauntika, dila, kemal, sulambra; ***Sanskrit***: jingini; ***Tamil***: kalasan, odi, udayan, uthi, wodier; ***Telegu***: appriyada, gumpena, gumpini, oddimanu.



Description

A medium-sized to large deciduous tree with a spreading crown and stout branches. Bark grey or whitish, smooth, exfoliating in irregular, rounded plates. Leaves imparipinnate, 25–45 cm long, crowded at the ends of branches; leaflets 7–9, oblong-ovate, 7.5–15 cm long and 2.5–5 cm wide. Flowers small, yellowish or purplish, unisexual: male fascicled, in slender compound racemes, female in simple pubescent racemes. Fruit red, compressed, reniform, 1-seeded. Flowers and fruits between February and June in western central Indian deciduous forests; trees leafless between November–December and June.

Distribution and habitat

An Indo-Malaysian species whose native range extends from northwestern India to Sri Lanka, Myanmar (Burma), Indochina and Hainan. It is found throughout the greater part of India to an altitude of 1500 m, in sub-Himalayan sal (*Shorea robusta*)-dominated forests, and is common in the mixed deciduous forests of the hills and plains, particularly in dry locales. Often planted as an avenue tree, and sometimes used for marking field boundaries.

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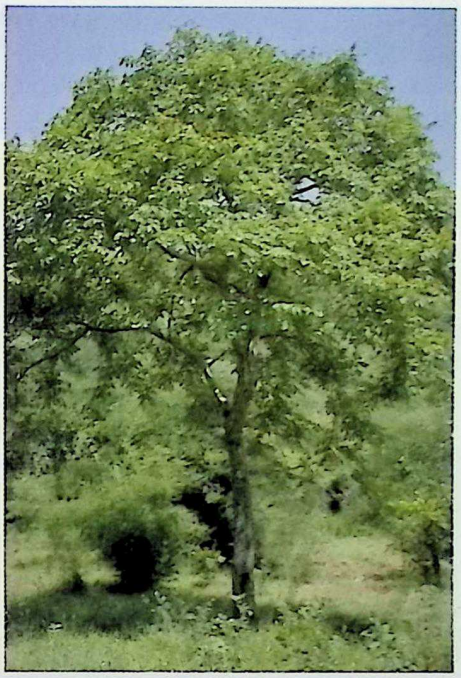
Medicinal properties and uses

The acrid, astringent bark is used to prepare a lotion for relieving bruises, wounds, sores, ulcers and sore eyes. The fresh juice of the bark is used externally to relieve sore eyes and to promote the healing of obstinate ulcers. The gum exuded from the cut bark, known as '*jingani gum*', is given in the treatment of asthma, and as a cordial to women during lactation. The bark has stimulant properties and is reported to be used to treat gout, and in the form of a decoction as a gargle for mouth ulcers (aphthae) and toothache, and as a lotion for skin eruptions. A dilute decoction of the bark is used as an expectorant among the tribal inhabitants of western Maharashtra. The dried, powdered bark, mixed with neem oil (from the seeds of *Azadirachta indica*: *Meliaceae*), is used as an application for chronic ulcers and skin diseases such as impetigo. The leaves are boiled in oil and applied to relieve sprains and bruises, local swellings, body pains and in the treatment of elephantiasis. A paste of the leaves mixed with black pepper is used as an external application for treating rheumatism. In Bengal, the juice of the green branches is given as an emetic in cases of coma or insensibility produced by opium or other narcotics. In Ayurveda, the bark and resin are used to treat wounds, cardiac disease, diarrhoea and diseases of the nervous system.



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Mangifera indica L.

Common names

Bengali: am, ambra; ***English***: mango tree; ***Gujarati***: ambo, amri; ***Hindi***: aam, am, amb; ***Kannada***: amba, ballimavu, maavina, mavinahannu, mavu, simavu; ***Konkani***: ambo; ***Malayalam***: amram, cutam, mampalam, mavu; ***Marathi***: amba, ambi; ***Oriya***: ambo, amo, boulo, chuto, uda; ***Punjabi***: am, amb, mawashi; ***Sanskrit***: amra, amrah, sahakara; ***Tamil***: maa, mamaram, manga, mau; ***Telegu***: amramu, mamadi, mamidi, mampalam, mavi; ***Urdu***: amba.

Description

A large, evergreen tree, 10–45 m tall, with a heavy, dome-shaped crown and a straight, stout bole. Bark thick, rough, dark grey, flaking off when old. Leaves linear-oblong or elliptic-lanceolate, 10–30 cm long and 2–9 cm wide, with an aromatic, resinous odour when crushed. Inflorescence a large panicle, containing up to 3000 flowers; flowers tiny, reddish-white or yellowish-green, with a pungent odour; staminate and hermaphrodite flowers borne in the same panicle. Fruit a large drupe, highly variable in form and size; fruit skin thick or thin, leathery, green, yellowish or red, often dotted with numerous glands; flesh (mesocarp) whitish-yellow, yellow or orange, firm, soft or juicy, slightly acidic to sweet, richly aromatic; fibres throughout the flesh in some varieties, absent or few in others; seed solitary,

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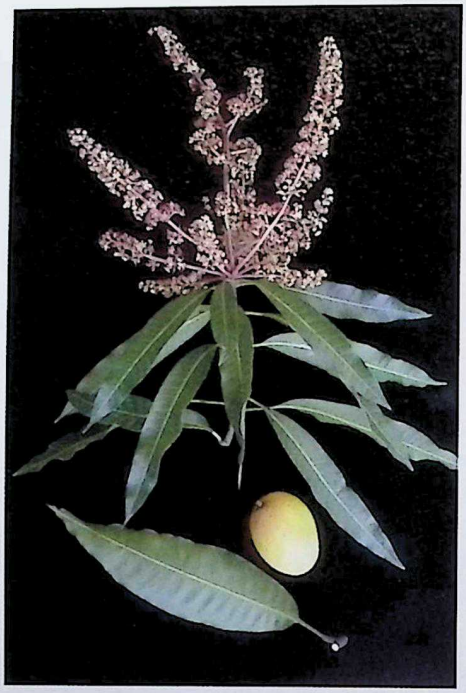
ovoid-oblique, encased in a hard, compressed, fibrous endocarp (stone). In peninsular India, flowering generally occurs between December and January, with peak fruit ripening approximately 5 months later.



Distribution and habitat

Centre of origin uncertain, though probably from northeastern India (Assam) to Myanmar (Burma) and northern Thailand, and in the higher hills of the Satpura range and the Western Ghats. Cultivated throughout India for at least 4000 years, and naturalized in tropical and subtropical hill forests, particularly near rivers and in ravines. Common in the subtropical Himalayas, the hills of the Western and Eastern Ghats and forests of central India, Bihar, Orissa, Assam and the Andaman Islands. Numerous varieties are grown in plantations and orchards, around homes, along avenues and field borders throughout India south of Kashmir.

Medicinal properties and uses

Ripe mango fruit is a rich source of vitamins A and C, is recommended as a laxative and diuretic and a restorative tonic, and is useful for treating heat-stroke. It is also thought to be useful for treating haemorrhage of the uterus, lungs and intestines. The unripe fruits are used for treating ophthalmia. The rind of the fruit is astringent and is used as a stimulant tonic for treating stomach debility. The sun-dried fruit, whether green or ripe, is recommended as an antiscorbutic. The astringent seed kernel is used to treat diarrhoea and its juice can be inhaled to stop nasal bleeding; among the tribal inhabitants of Madhya Pradesh, the kernel is reportedly used to treat diabetes. The powdered seed kernel is used as an anthelmintic and also as an astringent to treat bleeding piles. Dried mango flowers are astringent, and prescribed for diarrhoea, chronic dysentery and inflammation of the bladder. The leaves are chewed to give tone to the gums. The fumes from the burning leaves are inhaled for relief from hiccups and throat affections, and the ash of the burnt leaves is a house-

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hold remedy for burns and scalds. A cold aqueous extract of the tender leaves is taken internally to relieve diarrhoea in parts of southern Orissa; in this region a paste prepared from the ground bark in water is also used for this purpose. The astringent bark is used to treat diphtheria and rheumatism, and is believed to have a tonic action on the mucous membrane. It is also used to treat uterine haemorrhage, haemoptysis and melaena, diarrhoea and other discharges; mixed with the root bark of *Ziziphus nummularia* (*Rhamnaceae*) and the stem bark of *Syzygium cumini* (*Myrtaceae*), it is reportedly taken orally as an abortifacient among the Bhils. The gum resin exuded from the cut bark is used in dressings for cracked feet and scabies, and is considered anti-syphilitic.

References

Chopra *et al.* (1956, 1969), CSIR (1948–1992), Joshi (1989), Kirtikar *et al.* (1935), Mohanty *et al.* (1996), Nadkarni (1954), Shah and Singh (1990), Yoganarasimhan (1996).

Semecarpus anacardium L. f.

Common names

Bengali: bhela, bhelatuki; ***English***: marking nut tree, oriental cashew; ***Gujarati***: bhiamu, bhilamu; ***Hindi***: bhela, bhelwa, bhilawa, bhilwan; ***Kannada***: gheru, goddu geru, karee geru, karigeru; ***Konkani***: bibbayi; ***Malayalam***: chera, temprakku, thenhotta; ***Marathi***: bhilava, bibha; ***Oriya***: balia, bhallia, bhollia; ***Punjabi***: bhela, bhiladar, bhilawa; ***Sanskrit***: bhallataka, bhallatakah; ***Tamil***: erimugi, serangkottai, shenkottei, thembarai; ***Telegu***: bhallataki, bhallatamu, jidi, jiri; ***Urdu***: bhilanvana.

Description

A small to medium-sized deciduous tree, up to 15 m tall, with rough, dark brown bark. Leaves large, simple, 17–60 cm long and 10–30 cm wide, obovate-oblong. Flowers small, dull greenish-yellow, dioecious, in terminal hairy panicles. Fruits (drupes) 2.5 cm long, obliquely ovoid, smooth and shiny, black when ripe, attached to a fleshy, orange-coloured, receptacle (hypocarp). In central Indian forests, flowers between July and September and fruits from January to March; in this region trees remain leafless between January–February and May–June.

Distribution and habitat

Common throughout sub-Himalayan and tropical regions of India, particularly in deciduous forests of peninsular India, often in association with sal (*Shorea robusta*), and in the foothills of the Himalayas to an elevation of 1000 m. Also found in Malaysia and northern Australia.

Medicinal properties and uses

The fruit is acrid, hot and anthelmintic, and considered useful in the treatment of ascites, tumours and warts, acute rheumatism, asthma, neuralgia, epilepsy and psoriasis. In Ayurvedic practice it is considered to be a toxic drug and is used after undergoing a curing process; it is an ingredient of numerous important Ayurvedic preparations. The

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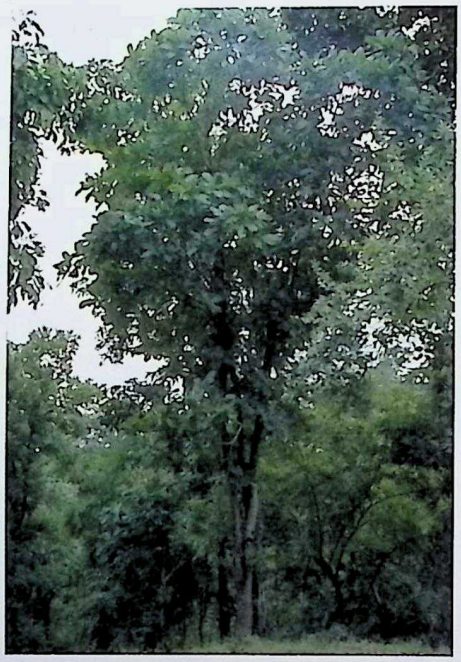

bruised nut is sometimes given as a vermifuge, and reportedly used as an abortifacient. Extracts from the fruit are reportedly effective against human epidermoid carcinoma of the naso-pharynx in tissue culture. Oral administration of the nut juice to patients suffering from mouth and oesophageal cancer appears to have beneficial effects, resulting in symptomatic relief and extension of survival time. Extracts obtained from boiling the nut in milk have proved useful in the treatment of sciatica. The seed oil is given to relieve coughs and colds among the Paharia in southern Bihar. The juice of the pericarp, and also of the stem bark, is a powerful counter-irritant and vesicant, causing painful blisters on the skin. The gum or gum resin exuded from the cut bark is used to treat leprous affections and nervous debility. Roots cooked in sour rice water are reported to cause sterility in women when eaten. Among the Kondhs of southwestern Orissa, a decoction of the roots is taken internally as a remedy for eczema.

References

Chopra *et al.* (1956, 1969), CSIR (1948–1992), Girach (1992), Kirtikar *et al.* (1935), Nadkarni (1954), Sivarajan and Balachandran (1994), Varma (1997), Yoganarasimhan (1996).

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Spondias pinnata (L. f.) Kurz.

Botanical synonyms

Mangifera pinnata L. f., *Spondias acuminata* Roxb., *S. macrophylla* Wall. ex Hook. f., *S. mangifera* Willd.

Common names

Bengali: amna, amra, ambra; ***English***: Indian hog-plum, wild mango; ***Gujarati***: ameda, ranamba; ***Hindi***: amara, amera, amra, jangli am; ***Kannada***: ambate, ambattemara, amatekaye, gooddamate, kaadamate, kaadu amate, marahunsie, poondi, vrykshamla; ***Konkani***: ambado; ***Malayalam***: ambalam, ambazham, ampalam, kataambolam, mampuli, puliman; ***Marathi***: amb, anbada, ranamba; ***Oriya***: amaratoko, ambada, ambota, ambula, amodo; ***Punjabi***: ambara, bahamb; ***Sanskrit***: amrataka, amratakah; ***Tamil***: ambalam, ambiram, ampallai, eginam, ibangam, katamara, kathimagirangai, kat maa, kotamara, mam pulicchi, manpulichi, mari-man-chedi, pullipullama; ***Telegu***: amratakamu, adavimaamidi, aravi mamadi, ivurumaamidi, kondamaamidi.

Description

A small to medium-sized tree with thick, smooth, grey, aromatic bark. Leaves imparipinnate, 20–60 cm long, leaflets 5–11, ovate-oblong, elliptic or elliptic-oblong, more or less oblique with a mango-like smell. Flowers white to pinkish-green, polygamous, sessile, numerous, borne in large, terminal panicles 25–38 cm long; calyx-teeth minute, triangular; petals 2.5–3 mm long, ovate-oblong, acute. Fruits (drupes) yellow-green or rich olive-green, mottled with yellow and black, smooth, ovoid, 4–7 cm long; stone woody, hard, rough with irregular furrows and cavities, fibrous outside; seeds 1–3, oblong-elliptic. In central Indian deciduous forest regions trees remain leafless between December and June. Flowers from February to March and fruits ripen the following year in January and February.

Distribution and habitat

Native to India, Myanmar (Burma), Thailand, Indochina, southern China and

throughout Malesia to the Solomon Islands. Occurs throughout India to an altitude of about 1500 m in the Himalayas, usually on well-drained soils, in deciduous, often dry forests, rarely common and never gregarious. Commonly cultivated throughout India for its edible fruits.

Medicinal properties and uses

The unripe fruits are prescribed for sore throat. The juice of both the fruit and the leaves is used to treat earache. The fruits, which are eaten either green or when ripe, are astringent and antiscorbutic. They are reportedly useful for treating diarrhoea, dysentery and bilious dyspepsia. In Ayurvedic practice the astringent, aromatic leaves and bark are used to treat dysentery. The bark is also useful for treating diarrhoea, bilious dyspepsia and to prevent vomiting. A paste of the ground bark mixed with water, or of the fruits, is used as a rub for both articular and muscular rheumatism among the Munda. A decoction of the bark is reportedly used to treat gonorrhoea. The root is considered useful for regulating menstruation.

References

Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Mohanty *et al.* (1996), Nadkarni (1954), Sivarajan and Balachandran (1994), Yoganarasimhan (1996).

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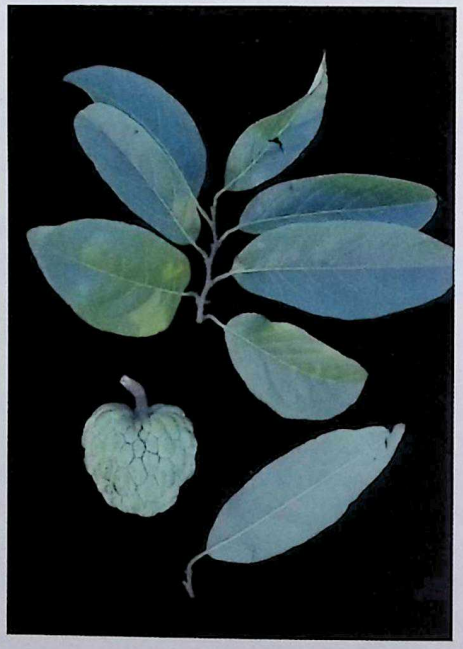
Annonaceae

Annona squamosa L.

Botanical synonym

Annona asiatica L.

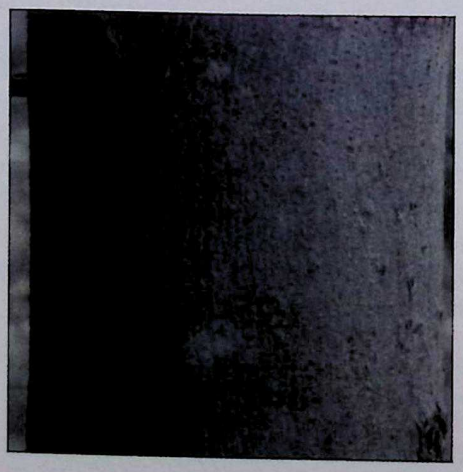


Common names

Bengali: ata, seetaphal; ***English***: custard apple, sweet sop; ***Gujarati***: anan, anuram, anuri, sitaphal, sitaphali; ***Hindi***: ata, sharifa, sitaphal; ***Kannada***: sitaphala; ***Konkani***: at, ath; ***Malayalam***: attichakka, sirpha, sithapazham; ***Marathi***: sitaphal, sitaphala ; ***Oriya***: ato, sithapholo; ***Punjabi***: sharifa; ***Sanskrit***: gandhagataram, gandagatra, krishnabija, seetaaphalam, sitaphala; ***Tamil***: atta, seethappazham, sita, sitapalam; ***Telegu***: gandhagaalaramu, sitaaphalamu sita pandu.

Description

A large deciduous shrub or small tree 3–8 m tall with thin, dark brown to greyish bark; leafy branches greyish-white, pubescent or glabrate. Leaves oblong-lanceolate or elliptic, 5–15 cm long and 2–5.5 cm wide, base obtuse or rounded, apex acute or obtuse, pellucid-dotted and peculiarly scented; petiole 0.4–1.2 cm long, slender, with a sharp-edged groove. Flowers fragrant, creamy-yellow to greenish, solitary or in groups of up to 4 in leaf-opposed cymes. Fruit globose or ovoid, 5–12 cm in diameter, yellowish-green when ripe, embossed with prominent scales and filled



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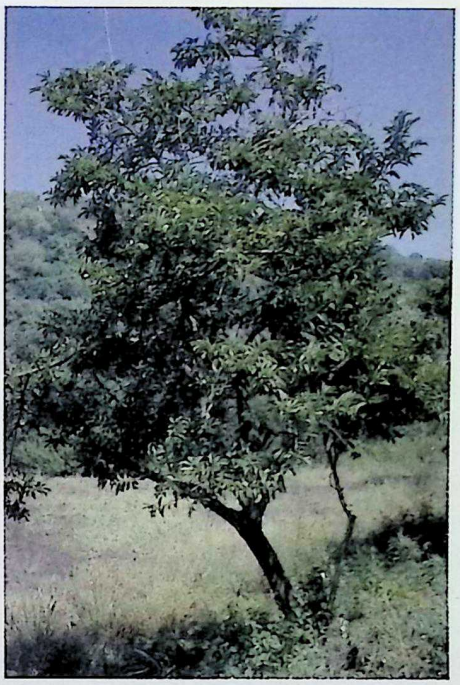
with an edible, juicy, pulp surrounding the smooth, shining, brownish-black seeds. Flowers between March and August; fruits ripen from August to November, depending on locality. In central India, flowering occurs mainly in April and May and fruiting in July and August.



Distribution and habitat

Custard apple is either native to India or was introduced to the region prior to recorded history, for it is referred to or depicted in ancient literature, painting and sculpture. It is cultivated throughout the tropics and warmer subtropics for its edible fruit, and has become naturalized throughout India to an altitude of 900 m.

Medicinal properties and uses

The ripe fruit possesses astringent, cooling, antiscorbutic, febrifugal and pectoral properties. As a tonic it is reported to enrich the blood and improve muscular strength. It is considered good for the digestion and is prescribed for vomiting, diarrhoea, dysentery and vertigo. The dried, powdered, unripe fruits are considered effective in healing ulcers, and are used as an insecticide, particularly for lice. Both the ripe pulp and crushed leaves are mixed with salt and applied as a poultice to hasten suppuration of boils, and to relieve pains and swellings; the leaf poultice is used to kill lice, prevent bedbugs and maggots, and is also used to extract guinea worms. The leaf is reported to possess stimulant, antispasmodic and sudorific, anthelmintic and insecticidal properties. A tea made from the leaves is given to alleviate fevers. Fresh leaf-juice is applied to the nostrils in cases of hysteria and fainting. Leaves and fruits are used to treat tumours; leaf extracts have been shown to have anti-cancer properties. The roots are reported to be diuretic and a strong purgative, and are given in acute dysentery. They are also used to treat depression, spinal diseases, asthma and fever. The seeds are used as a contraceptive and as an abortifacient.

Warning

The seeds, known for their insecticidal and piscicidal properties, are strong irritants to the conjunctiva and have been reported to cause blindness; therefore, great care should be taken when handling seeds to prevent contact with eyes.

References

Asolkar *et al.* (1992), Chatterjee and Pakrashi (1991), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Girach *et al.* (1997), Kirtikar *et al.* (1935), Nadkarni (1954).

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Artabotrys hexapetalus (L. f.) Bhandari

Botanical synonyms

Annona hexapetala L. f. Merrill., *A. uncinata* Lam., *Artabotrys odoratissimus* R.Br., *A. uncinatus* (Lam.) Merrill, *A. uncatus* (Lam.)

Common names

Bengali: katchampa; ***English***: climbing ylang-ylang; ***Gujarati***: lilo champo, nag-champo; ***Hindi***: hara champa; ***Kannada***: kandalisampage, manoranjini; ***Konkani***: kalo-champu; ***Malayalam***: manoranjitham; ***Marathi***: hirva champa; ***Oriya***: kalomuro, monasocompa; ***Sanskrit***: harachampaka, madanah, nilachampaka, phalasampenga; ***Tamil***: manoranjidam; ***Telegu***: aakusampenga, manoranjani, manoranjidamu.

Description

A large scandent or climbing shrub; older stems often very thick, covered with rather smooth grey bark with thick, woody, pointed spines 2–4 cm long. Leaves 5–20 cm long and 2–5 cm wide, narrowly elliptical, usually 3–4 times as long as wide, glabrous, shining, apex shortly acuminate, base acute; petioles 0.6–1 cm long. Flowers fragrant, solitary or in pairs, 3.2–3.8 cm long, petals yellowish-green, clothed with appressed silky hairs. Fruits (berries) obovoid, 2–3.8 cm long and 2.2 cm in diameter, yellow when ripe; seeds oblong, deeply grooved on one side, 1.3 cm or more long.

Distribution and habitat

Probably native to the dry forests of southern India and Sri Lanka, it is very commonly cultivated in gardens throughout India for its fragrant flowers.

Medicinal properties and uses

The flowers are used to prepare a stimulating tea-like beverage. In Ayurveda the flowers are considered useful for treating vomiting, biliousness, diseases of the blood, heart and bladder, itching, leucoderma, headache and erysipelas. A decoction of the leaves is reportedly used to treat cholera in parts of Malaysia.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Nadkarni (1954).

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Cananga odorata (Lam.) Hook. f. & Thoms.

Botanical synonyms

Canangium odoratum (Lam.) King, *Unona leptopetala* DC., *U. odorata* (Lam.) Blume, *Uvaria odorata* Lam.

Common names

English: Malayan custard apple, ylang-ylang; ***Kannada***: apurvachampaka; ***Malayalam***: kattu-champagom, madana; ***Sanskrit***: vanachembaga; ***Tamil***: karumugai, maladi, maramanoranjidam, sadi, sirusampagam; ***Telegu***: apporvachampakamu, chettu sampengi.

Description

An evergreen tree with a clear bole, up to 30 m tall; bark brownish-grey, fissured. Leaves alternate, ovate-oblong to broadly elliptic, 9–20 cm long and 4–9 cm wide, margins waved, apex finely acuminate, slightly pubescent beneath, with an unequal base; lateral veins including midrib at an angle of 45°; petioles about 1 cm long. Flowers very fragrant, 7.5 cm long, drooping, green at first and turning yellow with a purple-brown blot at the base inside; outer petals 0.8–1.2 cm wide, inner ones 0.5–0.7 cm wide. Fruits (berries) several, ovoid or oblong-ovoid, 1.5–2.3 cm long, glabrous, nearly black when ripe, pulpy; seeds 2–12, pale brown, pitted. Flowers twice annually from the second year onward.

Distribution and habitat

Native to Southeast Asia from Myanmar (Burma) to the Philippines and northern Australia. Grown in Indian gardens as an ornamental and to a small extent for the essential oil ('*ilang-ilang*') obtained from the flowers, which is used in perfumes.

Medicinal properties and uses

The fresh flowers are reportedly prescribed as a carminative and in the treatment of asthma; an infusion of the flowers is used after bathing or rubbed on the skin to prevent skin itching. The essential oil obtained from the flowers is used as an application in the treatment of headache, ophthalmia and gout. The leaves are employed for treating diarrhoea in infants, and are rubbed on the skin to relieve itching and boils. The fruits and seeds are used for treating fevers. The bark, rich in alkaloids, is sometimes given as a decoction for treatment of rheumatism, phlegm, ophthalmia, ulcers, fevers and to improve the complexion.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935).

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Polyalthia longifolia (Sonn.) Thwaites

Botanical synonyms

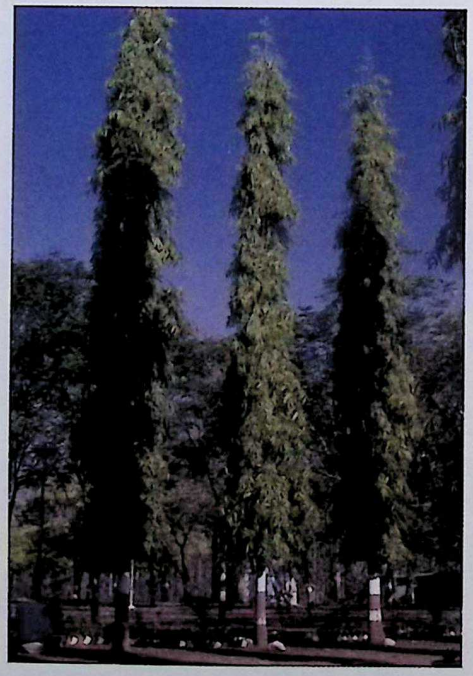
Guatteria longifolia (Sonn.) Wallich, *Unona longifolia* (Sonn.) Dunal, *Uvaria longifolia* Sonn.

Common names

Bengali: debdaru, devadaru; ***English***: cemetery tree, mast tree; ***Gujarati***: ashopalo, asopalav; ***Hindi***: asok, asoka, debdari, devadaru, devidari; ***Kannada***: hessare, kambadamara, putrajivi, ubbina; ***Konkani***: assok, devandaru; ***Malayalam***: arana, ashokam, chorana, choruna; ***Marathi***: asok, dedbari; ***Oriya***: asupal, debdaru; ***Sanskrit***: asoka, asopalava, devadaru, kasthadaru, putranjiva, ulkatah; ***Tamil***: asogu, assothi; nettilingam; ***Telegu***: asokamu, nara maamidi.

Description

A tall, elegant, evergreen tree, usually columnar in form, with a dense crown, straight trunk and smooth, thick, greyish-brown bark. Leaves glossy green, ovate-oblong or ovate-lanceolate, 14–22 cm long and 2.5–4.5 cm wide, apex attenuate, base obtuse or rounded, margins undulated; petioles 0.4–0.8 cm long. Flowers yellowish-green, numerous in axillary fascicles or umbels. Fruit a cluster of small, ovoid, 1-seeded carpels, purple when ripe; carpels 1.5 cm long, stalked, obtuse at both ends; glabrous. Flowers between February and May; fruits between July and September throughout India.



Distribution and habitat

Considered to be native to the drier regions of the southern Deccan peninsula and Sri Lanka in gallery forests, usually on good soils, often gregarious and associated with *Terminalia arjuna* (*Combretaceae*). It is very commonly cultivated throughout India, peninsular Malaysia, Java and in other tropical countries, in gardens and along avenues.

Medicinal properties and uses

The bark is used as a febrifuge in some parts of India, and is often employed as an adul-

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terant of, or substitute for, the bark of *Saraca asoca* (*Fabaceae-Caesalpinioideae*), which is more highly valued for treating uterine disorders, particularly uterine haemorrhages, dysmenorrhoea and menorrhagia.

References

Chatterjee and Pakrashi (1991), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Nadkarni (1954), Sivarajan and Balachandran (1994), Yoganarasimhan (1996).

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Anthericaceae

Chlorophytum arundinaceum Baker

Common names

Hindi: biskandri, safed musli; ***Oriya***: banadhau, bharat batuli; ***Sanskrit***: musali, sweta-musli.

Description

A small perennial herb with spirally arranged basal leaves. Leaves suberect, lanceolate, up to 80 cm long and 2 cm wide. Flowers white, star-shaped, 1.8–2.3 cm in diameter, sepals oblong-lanceolate, anthers green to yellow, as long or longer than filaments, borne in long racemes on stout stalk (scape) up to 1 m tall. Fruits (capsules) subglobose.

Distribution and habitat

Found in northeastern India from Bihar to Manipur, extending into Myanmar (Burma), and in peninsular India from Orissa and Maharashtra southwards to Tamilnadu to an altitude of 1200 m.

Medicinal properties and uses

The tubers constitute a commercial drug known as *safed musli*, considered to be a valuable nervine and general tonic for strength and vigour. The fried root powder is chewed to promote healing of ulcers (aphthae) of the mouth and throat. A decoction of the root with turmeric (*Curcuma longa*: *Zingiberaceae*) is prescribed for rheumatism. Among tribal women in central Orissa, an extract of the roots crushed in rice water is taken for dysmenorrhoea. In Ayurveda the root is used for treating sprue, piles, blood disorders, and as an aphrodisiac and rejuvenator. The leaves and flowers are edible.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Nadkarni (1954), Sahoo and Mudgal (1995), Yoganarasimhan (1996).

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Apiaceae

Coriandrum sativum L.

Common names

Bengali: dhane; ***English***: coriander; ***Gujarati***: dhana, dhania, konphir; ***Hindi***: dhania, dhanya, kottmir; ***Kannada***: havija, kotambari, kothambri; ***Konkani***: kotbor, kotbori, kottumbari; ***Malayalam***: kothumpalari, kottampalari; ***Marathi***: dhane, dhanya, khotbir, khotimbir, khotmir, kothmir; ***Sanskrit***: dhanyaka, dhanyakam; ***Tamil***: kottamalli; ***Telegu***: dhaniyalu, kotimiri; ***Urdu***: dhania.

Description

A glabrous annual herb 40–50 cm tall. Upper leaves short-petioled or subsessile, 2–3-pinnatisect into linear-setaceous lobes; lower leaves petioled, imparipinnatisect into 2–3 pairs of ovate-cuneiform, obtuse, incised-dentate segments. Flowers white, pinkish or purplish, borne in compound 3–10-rayed umbels; rays 1–2.5 cm long. Fruits orbicular, ribbed, 2–5 mm long and 1.5–3 mm wide; seeds twice as broad as thick. Flowers and fruits from February to April.

Distribution and habitat

Native to the eastern Mediterranean region, now widespread as both a cultivated and naturalized weedy species throughout the warmer regions of the world. Cultivated throughout India for its leaves and seeds, which are used in Indian cooking as a condiment and spice.

Medicinal properties and uses

The juice of the fresh plant is used to treat erythema; a strong decoction in milk (1 : 40) with a little sugar is useful for dyspnoea, flatulence, indigestion and bleeding piles. Coriander water is useful for relieving indigestion and other bowel complaints. An infusion or decoction of the dried fruits is used to treat bilious complaints, the common cold, flatulence, indigestion, intestinal troubles, sore throat and vomiting; it is used as an eyewash in chronic conjunctivitis, and

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is a good carminative in combination with cardamom and caraway seeds. A cold infusion of the seeds with sugar is used for relieving colic in children. The roasted seeds are helpful for treating dyspepsia. A paste of the seeds is applied locally for treating headache and cough; mixed with barley meal, it is applied as a poultice to treat chronic ulcers and carbuncles. The seed oil is used for the relief of colic, flatulence, neuralgia and rheumatism. The seeds are chewed to sweeten the breath. The leaves are antibilious and carminative; in Unani medicine they are considered hypnotic and analgesic and are used for treating piles, inflammation, pain in the eyes, gleet, jaundice, stomatitis, toothache, bleeding gums, scabies and tuberculous glands.

References

Asolkar *et al.* (1992), Chatterjee and Pakrashi (1995), Chopra *et al.* (1956, 1969), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

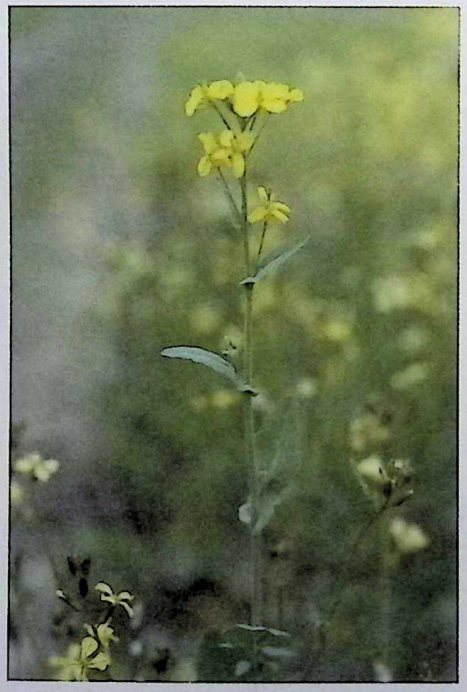
Eruca vesicaria (L.) Cav. subsp. *sativa* (Mill.) Thell.

Botanical synonym

Eruca sativa Mill.

Common names

Bengali: swetsursha; ***English***: rocket salad, roquette, taramira; ***Hindi***: safed sarson, seoha, taramira; ***Marathi***: jambho; ***Punjabi***: assu, jamba, tara, taramiri, usan; ***Sanskrit***: kadambada, siddartha, sidharta.



Description

A variable, erect annual herb up to 1.3 m tall, with fleshy toothed leaves and yellow or lilac flowers. Fruits (pods) 2.5 cm long, erect, appressed to the stem. Seeds numerous, small, ovoid, light reddish-brown, smooth, arranged in a double row in each compartment of the fruit.

Distribution and habitat

A variety of mustard cultivated as a field crop in northern and central India, principally for its seeds that yield an edible oil (*taramira oil*) used for preparing pickles.

Medicinal properties and uses

The tender leaves of the plant are considered stimulant, stomachic, diuretic and antiscorbutic. The seeds are vesicant and reportedly have antibacterial properties. The young plant is eaten as a vegetable.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Nadkarni (1954).

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Eryngium foetidum L.

Common names

None reported.

Description

An erect biennial herb 15–40 cm tall, strongly aromatic, its odour similar to that of coriander with furrowed stems, a short rootstock and fibrous roots. Leaves oblanceolate-oblong in outline, 4–12 cm long and 1–2.5 cm wide, apex obtuse, margins crenate to finely spinosely serrate, base cuneate, sessile, glabrous. Flowers greenish, borne in dense, rounded cymes; involucral bracts 5–7, linear-lanceolate, 1–3 cm long and 3–7 mm wide, greatly exceeding the flower heads, leaf-like, spreading and reflexed with a few spiny teeth; flower heads cylindrical, 4–10 mm long and 3–5 mm broad, terminal on the branches or on short peduncles in the forks, sepals erect, lanceolate, longer than the petals, persistent, apex acute; petals greenish-white, oblanceolate to obovate, erect, clawed. Fruit (schizocarp) globose or ovoid, 1–1.5 mm long, compressed, densely papillose.

Distribution and habitat

Native to tropical and subtropical regions of the New World, now widespread throughout tropical Africa and Asia.

Medicinal properties and uses

The root is considered stomachic. The leaves are sometimes used as a substitute for coriander in cooking.

References

Chopra *et al.* (1956), CSIR (1948–1992).

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Girardinia diversifolia (Link) Friis

Botanical synonyms

Girardinia heterophylla Decne. *G. heterophylla* var. *zeylanica* Hook. f., *G. heterophylla* var. *palmata* Hook. f., *Urtica diversifolia* Link, *U. heterophylla* Vahl, *U. palmata* Forssk.

Common names

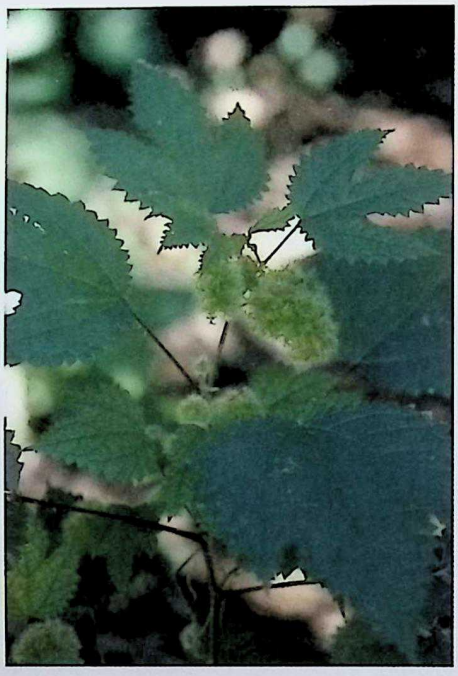
English: Nilghiri nettle; ***Hindi***: alla, awa, bichua, chichr; ***Kannada***: turike; ***Malayalam***: anachchoriyanam; ***Marathi***: motikhajati; ***Punjabi***: anjan, bhabar, kal, keri, kingi, sanoli; ***Sanskrit***: laghukacchu, lomasa, romalu, santativardhini, vatavidhvamsini; ***Telegu***: gaddanelli.

Description

An erect herb usually 1.2–1.8 m tall with perennial roots, fibrous stalk and long, stinging hairs; stem and branches furrowed. Leaves 10–25 cm long and often as broad, the upper leaves lobed, more or less pubescent, margins coarsely serrate, base cordate or truncate; petioles 7.5–18 cm long, armed with stinging hairs; stipules 13–16 mm long and 8 mm wide, ovate, cordate, shortly acuminate, bifid. Flowers borne in panicled spikes or heads, the males in the lower, the females in the upper axils; female flowers: perianth 2.5 mm long, lobes triangular, acute, hairy; male flowers: sepals 1.6 mm long, elliptic, obtuse; fruiting cymes short, stout, 2.5–5 cm long and 2.5–3.2 cm broad, densely clothed with stinging hairs. Achenes 4 mm long and nearly as broad as long, obliquely ovate, compressed.

Distribution and habitat

Common in the hills of western and southern India from Rajasthan and Madhya Pradesh southwards to Kerala.



Medicinal properties and uses

In Ayurveda, the root is used to treat hydrocele and oedema. The leaves are reportedly applied externally to relieve headaches and swollen joints, and their decoction for fevers.

Warning

The stinging hairs of the plant cause dermatitis.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

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Heracleum rigens Wallich ex DC.

Botanical synonym

Pastinaca rigens (DC.) Wight

Common names

Kannada: gaalibeeja.

Description

A suberect hispid herb up to 1 m tall with stout, aromatic roots. Lower leaves pinnately compound, leaflets rounded at apex, margins crenate-serrate; upper leaves simple. Flowers white or sometimes yellow, borne in umbels; rays 10–30; involucres composed of several linear-lanceolate hirsute and caducous bracts, and involucels of several bracteoles; outer petals sometimes larger than inner; calyx lobes present. Fruit (schizocarp) elliptic to obovate, 8–10 mm long and 5–7 mm wide; mericarps with winged lateral ribs and filiform dorsal ribs.

Distribution and habitat

Found in southern peninsular India, in the Western Ghats and in hill forests of interior districts of Karnataka and in the Nilgiri and Palni Hills of western Tamilnadu.

Medicinal properties and uses

Known as *Sukshma ela* in Ayurveda, the seed oil is used to treat urinary disorders, hyperacidity, wasting diseases, cardiac diseases, wounds, pruritis, abdominal disorders and vomiting. In Siddha, the plant is known as *Cittrelam*, the seed being used for treating constipation, stomach-ache, diarrhoea, headache, gastric disorders and indigestion.

Reference

Yoganarasimhan (1996).

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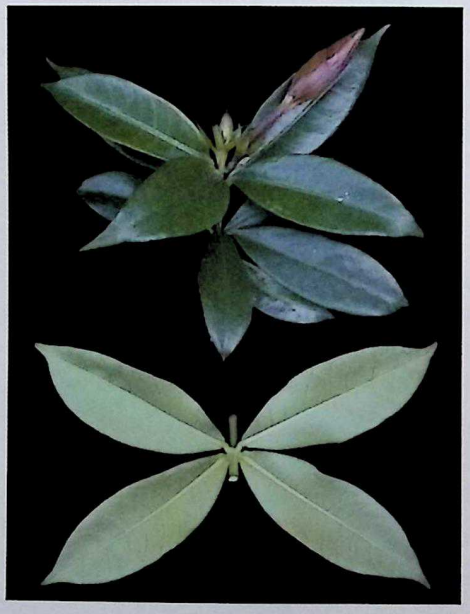
Apocynaceae

Allamanda cathartica L.

Common names

Bengali: harkakra; ***English***: campanilla, golden trumpet, willow-leaved allamanda; ***Kannada***: allamanda gida, arasinhu, haladilu; ***Konkani***: kanagani; ***Malayalam***: kolaambi; ***Telegu***: allemandatheega.



Description

A straggling or climbing evergreen shrub up to 4 m tall. Leaves mostly in whorls of 4, obovate to oblong-lanceolate, 8–12 cm long and 2.5–4 cm wide, apex acuminate, margins wavy, lateral veins distinct. Flowers large, showy, bright- or golden-yellow, in terminal, cymose panicles; corolla tube 4–8 cm long, lower half cylindrical, upper campanulate. Fruits (capsules) prickly, containing many obovate, flat, winged seeds.

Distribution and habitat

Native to tropical America, and planted in gardens throughout India; sometimes naturalized.

Medicinal properties and uses

The leaves are reportedly used in moderate doses as a cathartic. Their infusion or extract is given to treat colic, although in large doses it may cause vomiting and diarrhoea. The bark and its decoction are reportedly administered as a hydragogue to treat ascites. The dried roots contain an antileukaemic iridoid lactone, allamandin, and two other iridoids, allamandicin and allamdin.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935), Nadkarni (1954).

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Alstonia macrophylla Wallich ex G. Don

Botanical synonyms

Alstonia batino Blanco, *A. oblongifolia* Merrill, *A. pangkhorensis* King & Gamble

Common names

English: matchstick tree.

Description

A small to medium-sized tree with smooth blackish-brown to greyish bark. Leaves in whorls of 3–4, oblong-lanceolate, 10–50 cm long and 4–14 cm wide, base cuneate, apex short-acuminate, densely pubescent beneath when young, with distinct lateral veins 0.6–2 cm apart from each other; petioles slender, 1–3 cm long. Flowers small, white, fragrant, salver-shaped, in corymbose cymes at the end of twigs among leaves; pedicels much longer than calyx. Fruits (follicles) numerous, slender, pendulous, 30–45 cm long and 0.6 cm wide, containing slender, 6-mm-long seeds.

Distribution and habitat

Native to peninsular Malaysia, Indochina, the Philippines, Celebes and Borneo in primary and secondary lowland evergreen to deciduous forests. Planted in gardens in India, Sri Lanka and other tropical countries; occasionally naturalized.

Medicinal properties and uses

The bark is said to possess emmenagogue, anticholeric and vulnerary properties. It can be administered as a decoction, infusion or tincture. Although differing in its alkaloidal composition, the bark of this species is reportedly used like that of *Alstonia scholaris*, which in Ayurvedic practice is used to treat a variety of ailments, including cancer-like conditions. The leaves, coated with coconut oil and heated, are applied as a hot poultice to relieve sprains, bruises and dislocated joints.

References

Asolkar *et al.* (1992), CSIR (1948–1992).

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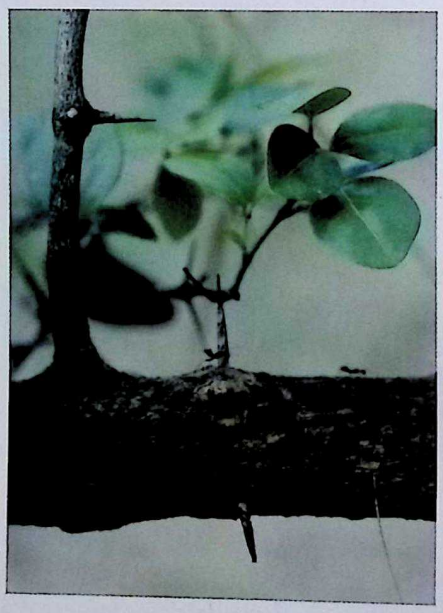
Carissa carandas L.



Common names

Bengali: bainchi, karamcha, karancha; ***English***: Christ's thorn, karaunda; ***Gujarati***: karamadi, karamda, timbarran; ***Hindi***: garinda, karaunda, kantakregi, karondi, korada; ***Kannada***: heggarichige, karekayi, kavali; ***Konkani***: carandam; ***Malayalam***: karakka, karavanda; ***Marathi***: karvanda; ***Oriya***: kerendo kuli; ***Sanskrit***: avighna, kanachuka, karamarda, karamardaka; ***Tamil***: kalaka, kalakkay, karaikkay, kila, perungkala; ***Telegu***: kalivi, peddakalavi, vaka, vakkaaya; ***Urdu***: karwanah.

Description

An evergreen shrub or small, crooked tree up to 3 m tall with dichotomous branches armed with simple or forked, 2–4-cm-long, paired axillary thorns. Bark yellowish-brown, peeling in square flakes. Leaves short-petioled, light green, leathery, glabrous and shining on both surfaces, obovate, elliptic or oblong, 3–7 cm long and 1.5–4 cm wide, apex obtuse, base cuneate or rounded. Flowers white or pink, faintly scented, in lax terminal cymes. Fruits (berries) ellipsoid, up to 2 cm long, red turning dark purple when ripe, normally 8-seeded. Flowers between March and April and fruits ripen between December and February in central India.

Distribution and habitat

Indigenous to India and found in dry forests throughout the country. Frequently cultivated in gardens for its edible fruits.

Medicinal properties and uses

All parts of the plant are used in traditional Indian medicine. The roots possess bitter, stomachic and anthelmintic properties. Alcoholic extracts of the roots exhibit cardiotonic activity as well as a deep and prolonged blood pressure-lowering effect. The leaves are prescribed for relief of remittent fevers. The fruits are considered antiscorbutic. In addition to its medicinal uses, the sour, astringent unripe fruits are used for preparing pickles, and the sweet, ripe fruits are used to prepare juices or carbonated drinks and in tarts, salads, puddings and jellies.

References

Asolkar *et al.* (1992), Chatterjee and Pakrashi (1995), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Nadkarni (1954).

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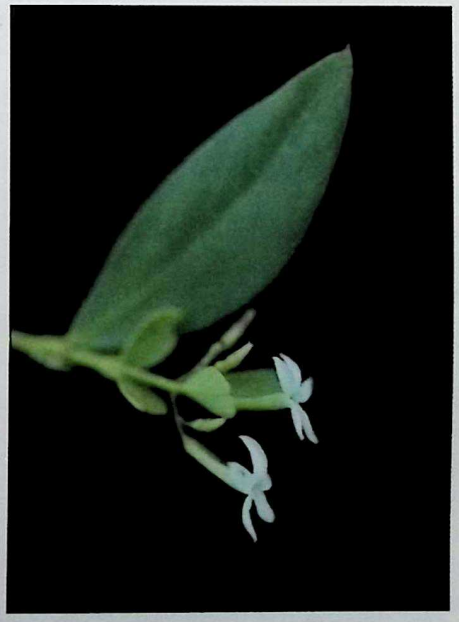
Carissa spinarum L.

Botanical synonym

Carissa diffusa Roxb.

Common names

Hindi: karaunda, karonda; ***Kannada***: chikkakaavali, kavali; ***Marathi***: karaunda, karonda; ***Oriya***: ankakoli; ***Punjabi***: gan, garaunda, garji, garna; ***Sanskrit***: karamadika, karamardika; ***Tamil***: chiru, chiru kila, kalachedi; ***Telegu***: kalivi, kalli, kelivi.



Description

A bushy, diffuse, evergreen shrub or rarely a tree up to 3.6 m tall with light grey, fibrous bark and rigid spreading branches and zig-zag branchlets armed with straight, 1.5–5-cm-long thorns. Leaves short-petioled, broadly ovate, rhomboid or elliptic, coriaceous, 1.5–5 cm long and 1.2–4 cm wide, apex acute or apiculate, base acute or rounded. Flowers fragrant, white, sometimes tinged with pink, in axillary or terminal corymbose cymes; corolla tube 1.2–2 cm long. Fruits (berries) globose or ovoid, 0.7–1.2 cm long, shining black or dark purple when ripe, usually 4-seeded. Flowers between November and February in central India.

Distribution and habitat

Native to South Asia from northwestern India to Sri Lanka and Myanmar (Burma). It is found throughout most of India in dry, rocky habitats, and often forms extensive undergrowths in forests dominated by bamboo, sal (*Shorea robusta*) and teak (*Tectona indica*) in Madhya Pradesh and Maharashtra. Also occurs naturally in the sub-Himalayan region up to 1500 m elevation and in the Andaman Islands. Common on overgrazed and otherwise highly disturbed sites throughout its range. Frequently cultivated in gardens to form hedges and for its fragrant flowers and edible berries.

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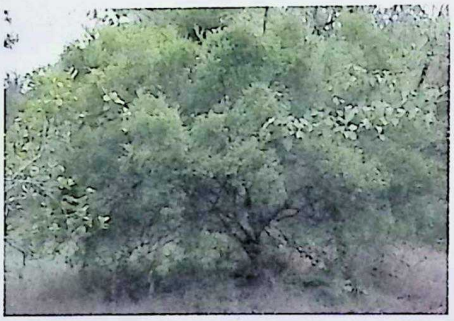
Medicinal properties and uses

The roots are used as a purgative in combination with other ingredients. The ground roots are used to treat worm-infested sores in livestock. In Siddha, the flower, fruit and root are used to treat eye and ear disorders, vomiting, distaste, body-ache, throat pain, sweating and as a carminative.



References

Asolkar *et al.* (1992), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

Cascabela thevetia (L.) Lippold

Botanical synonyms

Cerbera thevetia L., *Thevetia peruviana* (Pers.) Schum., *T. neriifolia* Juss. ex Steud.

Common names

Bengali: chinakarab, haldi korubi, kolilphul, kolkaphul; ***English***: lucky nut tree, yellow oleander; ***Gujarati***: pilakanera, pilakanir, pilokanera; ***Hindi***: kaner, kulkephul, pila kaner, zard kunel; ***Kannada***: kadukasi, kanogalu; ***Malayalam***: manja-areli, pachcha-areli, pachchai-alari; ***Marathi***: pivalakanher, sherani; ***Oriya***: konyar phul; ***Sanskrit***: ashvaha, ashvaghna, ashvamaraka, ashvantaka, divyapushpa, haripriya, karavirah, pachchai-alari, shatakunda; ***Tamil***: manjalaleri, pachaiyalari, tiruvachippu; ***Telegu***: pachcha-ganeru.

Description

A large evergreen poisonous shrub up to 6 m tall. Leaves alternate, simple, glabrous, narrowed at both ends, 10–15 cm long, acute. Flowers bright yellow or pinkish-yellow, lightly scented, borne in few-flowered, terminal cymes. Fruits (drupes) triangular, laterally compressed, fleshy, containing 2–4 seeds. Flowers and fruits mainly from March to July, sometimes throughout the year.

Distribution and habitat

Believed to be native to tropical America and the West Indies, it was introduced to India centuries ago as a garden ornamental. It has since naturalized in the plains throughout the country.

Medicinal properties and uses

The roots constitute the Ayurvedic drug *Karavirah* (also equated with *Nerium*

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indicum: *Apocynaceae*), well known as a poison but, under careful administration, used as a powerful cardiac tonic. It is considered bitter, hot, astringent, anthelmintic, carminative, diaphoretic and useful as an external application for treating ulcers, leprosy and skin diseases. The roots are made into a plaster and applied to relieve tumours. The seeds are used as an abortifacient, as an alexiteric and as a purgative in the treatment of rheumatism and dropsy. A decoction of the crushed raw fruits is used by the tribal inhabitants of Udaipur District in Rajasthan as a wash for boils. A decoction of the seeds acts as a violent emetic, hinders respiration and may cause paralysis of the heart; none the less, it is sometimes used to treat haemorrhoids. The seed kernels act as a contact poison; mashed with soap they are used as an insecticide. A tincture of the bark is used as a bitter cathartic, emetic and antipyretic in intermittent fevers; in larger doses it can be poisonous. The leaves are emetic and purgative. The latex from the plant is applied to cuts and wounds among the inhabitants of Bhadrak District in Orissa.

Warning

All parts of the plant contain cardiac glycosides and are considered poisonous, particularly the seed kernels and the milky juice obtained from all parts of the plant.

References

Chatterjee and Pakrashi (1995), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Girach *et al.* (1997), Katewa and Arora (1997), Kirtikar *et al.* (1935), Nadkarni (1954), Sivarajan and Balachandran (1994).

Catharanthus pusillus (Murr.) G. Don

Botanical synonyms

Lochnera pusilla (Murr.) K. Schumann, *Vinca pusilla* Murr.

Common names

Kannada: bili kaasi kanigalu, vishakanegale soppu; ***Malayalam***: kapavila; ***Sanskrit***: sangkhaphuli, sangkhi; ***Tamil***: kapa-vila, milagaipoondu; ***Telegu***: neru.

Description

An erect, much-branched, glabrous annual herb up to 60 cm tall with 4-angled branches. Leaves lanceolate, 2–7 cm long and 0.5–2 cm wide, apex acuminate; petioles 1.5–5 mm long. Flowers solitary or in pairs, corolla white, the tube 0.5–1 cm long, lobes half as long as the tube, apiculate at

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apices. Fruits small, divaricate, membranous follicles, in pairs, containing subcylindrical, black, ribbed seeds.

Distribution and habitat

Indigenous to India from the western Himalayas through the Gangetic plain and Deccan peninsula to Sri Lanka, commonly grows as a weed in cultivated fields and pastures throughout most of the country to an altitude of 1100 m. Cultivated in West Bengal.

Medicinal properties and uses

The plant reportedly possesses oncolytic (tumour-resolving) properties. A decoction of the dried plant is boiled in oil and used as a rub in the treatment of lumbago. In Ayurvedic practice, it is sometimes used as a substitute for *Catheranthus roseus*.

Warning

The plant is reported to be toxic, particularly to cattle, causing temporary blindness and body rashes.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935), Nadkarni (1954), Yoganarasimhan (1996).

Catharanthus roseus (L.) G. Don

Botanical synonyms

Lochnera rosea (L.) Reichb., *Vinca rosea* L.

Common names

Bengali: gulferinghi, nayantara; ***English***: Madagascar periwinkle, red periwinkle, old maid; ***Gujarati***: barmasi; ***Hindi***: sadabahar, sada suhagan, sada suhagi; ***Kannada***: kempu kaasi kanigalu, sadapushpia; ***Malayalam***: ushamalari; ***Marathi***: sadaphul; ***Oriya***: ainskati; ***Punjabi***: rattanjot; ***Sanskrit***: nityakalyani, rasna, sadampuspa; ***Tamil***: sudukadu mallikai; ***Telegu***: billaganneru.

Description

An erect, much-branched, annual or perennial herb, 30–90 cm tall. Leaves oblong-elliptic, glossy, with a slightly fetid odour, base acute, apex rounded. Flowers fragrant, white to pinkish-purple in terminal or axillary cymose clusters. Fruit (follicle) slender, hairy, many-seeded, 2–3 cm long; seeds oblong, minute, black. Flowers and fruits year-round, but mostly during the rainy season.

Distribution and habitat

Believed to be native to Madagascar, brought into cultivation during the 18th century in many tropical countries, including India, where it is planted in gardens and occasionally naturalized to an altitude of 1300 m. It is also cultivated for commercial

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drug purposes in India, Israel, Madagascar and the USA.

Medicinal properties and uses

All parts of the plant are rich in alkaloids, with maximum concentrations found in the root bark, particularly during flowering. Of these, vinblastine, vincristine, leurosidine and leurosine are oncolytic alkaloids of proven value for the treatment of various cancers, including Hodgkin's disease, lymphosarcoma, choriocarcinoma, neuroblastoma, carcinoma of the breast, lungs and other organs as well as acute and chronic leukaemia. The total alkaloids and chloroform fraction obtained from the roots have significant hypotensive, sedative and tranquillizing properties. An infusion of the leaves is used to treat menorrhagia. The juice of the leaves is applied externally to relieve wasp stings. All parts of the plant are credited with hypoglycaemic properties and are used to treat diabetes.

References

Asolkar *et al.* (1992), Chatterjee and Pakrashi (1995), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935), Nadkarni (1954), Yoganarasimhan (1996).

Ervatamia heyneana (Wall.) Cooke

Botanical synonym

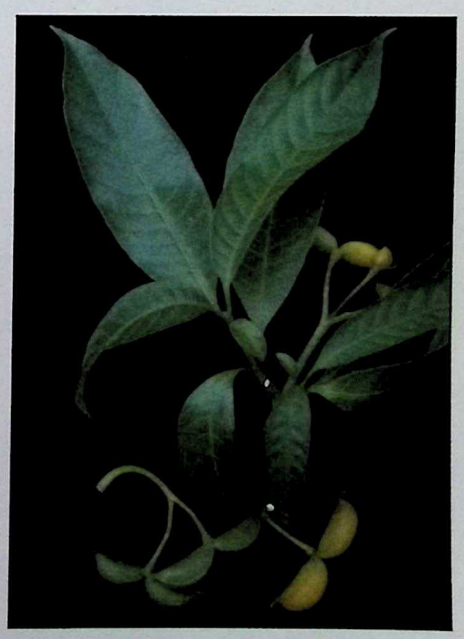
Tabernaemontana heyneana Wall.

Common names

Kannada: bilikodsalu, halmeti, maddarssa, madle mara, nagarkuda; ***Malayalam***: kundalapala; ***Marathi***: nag kuda, naglkudo, pandrakura.

Description

A small deciduous tree up to 9 m tall with rough grey bark. Leaves linear-oblong or lanceolate, 7.5–20 cm long and 2.5–7.5 cm wide, apex shortly acuminate, base acute; main nerves 12–16 pairs; petioles 0.8–2 cm long. Flowers white, borne in pedunculate, many-flowered cymes; peduncles 2.5–5 cm long; pedicels 1.3–2.5 cm long; buds clavate, rounded at the apex. Calyx 5 mm long, lobes 2 mm long, broadly oblong with membranous margins; corolla tube 1.6–2.5 cm long,



inflated near the top, limb 2.5 cm across when expanded with obtuse, crisped lobes overlapping to the right. Fruits (follicles) paired, orange-yellow when ripe, 1.2–3.2 cm

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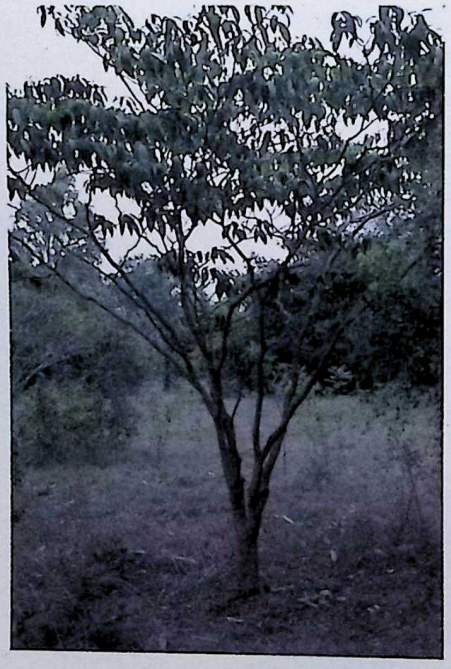
long and 1–1.3 cm wide, sessile and slightly recurved; seeds 2 per follicle, 8 mm long, surrounded by red pulp.

Distribution and habitat

Found in southwestern India in open forests of the Western Ghats from Konkan (Maharashtra) southwards through Kerala up to 900 m elevation.

Medicinal properties and uses

In southern India, the species is used medicinally as a substitute for *Tabernaemontana divaricata*, a closely related and more widely distributed species. The acrid, bitter root is used as a local anodyne and chewed to relieve toothache. Rubbed into a thin paste with water it is taken internally as a vermicide. It is also applied with lime juice to clear opacity of the cornea. Charcoal prepared from the root and the milky juice of the leaves is reportedly used to treat ophthalmia. The juice of the flowers, mixed with oil, is applied externally to relieve the burning sensation in sore eyes and for relief of some skin diseases. The milky juice of the leaves is used as a cooling application for wounds and to reduce inflammation.



References

Asolkar *et al.* (1992), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

Holarrhena antidysenterica (L.) Wall.

Botanical synonyms

Chonemorpha antidysenterica (Roth) G. Don, *Echites antidysenterica* Roth., *Holarrhena pubescens* (Buch.-Ham.) Wall. ex D. Don.

Common names

Bengali: indrajab, kurchi, titaindarjau; ***English***: conessi tree, tellicherry tree; ***Gujarati***: dhaowda, indirajar, kari, kuda; ***Hindi***: dudhi, indrajab, karchi, kurchi, kura; ***Kannada***: beppale, kodisige gida, korasigina-gida, korchie, kudsalo; ***Konkani***: davokudo, pala; ***Malayalam***: kodagapala; ***Marathi***: dola-kuda, kodaga, kuda, pandhara-kuda; ***Oriya***: kherwa, pita korwa, patru kurwa; ***Punjabi***: kawar, keor, kerwar, kewar, kura; ***Sanskrit***: indrayava, kalinga, kutaja, pandura; ***Tamil***: indrabam, kashappu-vetpalarishi, kodagapalei, kudas-appalai, vepali, veppalei; ***Telegu***: indravrakshamu, kakakodise, kodaga, kodisepala, pala, palakodsa.

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Description

A deciduous shrub or small tree up to 12 m tall with rough, pale brown or greenish bark that peels off in irregular flakes. Leaves opposite, subsessile, elliptic or ovate-oblong, 10–30 cm long and 5–12 cm wide, membranous, glabrous or pubescent, nerves 10–14 pairs, strongly arched. Flowers white, fragrant, borne in profusion in terminal corymbose cymes 7.5–15 cm long; pedicels slender; bracts small, lanceolate, pubescent and ciliate; calyx lobes 2.5–3 mm long, oblong-lanceolate, acute, ciliate; corolla tube 8–13 mm long, throat hairy inside, lobes about as long as the tube, oblong, rounded at apex, more or less pubescent. Fruits (follicles) parallel, cylindrical, 15–45 cm long and 0.5–1 cm in diameter, usually with long, white spots. Seeds 25–30 per follicle, light brown, narrowly linear-oblong, 0.8–1.3 cm long. In northern and central India, flowers between February and July just before appearance of new leaves, and often again from September to November; fruits ripen in January–February.

Distribution and habitat

Native to tropical Asia from India to Myanmar (Burma), Indochina and Malesia. It occurs almost throughout tropical India to an altitude of 1000 m, often gregariously in deciduous forests. Especially abundant in northern India in the sub-Himalayan tract, it is a very hardy species commonly found on deforested sites. It is also cultivated as a roadside and ornamental tree for its beautiful flowers and is a useful species for reforestation of degraded lands.

Medicinal properties and uses

In Ayurveda this species is the most widely accepted source of the drug *Kutajah*, the root bark and seeds being used to treat chronic dysentery and diarrhoea; the bark is also used in the compound preparations *Kutajabaleha* and *Kutajaarista*, prescribed for dysentery, liver ailments and uterine discharge. The powdered root is given to check dysentery among the Bondos of southern Orissa, and is prescribed as an anthelmintic among the tribal inhabitants of southern Bihar. A paste prepared from the ground root in water is used as an external rub to relieve rheumatic pain, gout and paralysis by the Asurs in Bihar. The seeds are credited with astringent, febrifugal, anthelmintic, antiperiodic and carminative properties. The raw seeds are eaten as an antitetanic among the tribal inhabitants of western Maharashtra. Their decoction is useful for relieving chronic dysentery, bleeding piles, intestinal worms and fever. Mixed with honey, the powdered seeds are used to treat chronic chest complaints, asthma and to relieve colic pain. They are an important ingredient in Ayurvedic prescriptions for flatulence, jaundice, piles and

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worms. The stem bark possesses astringent, antidysenteric, anthelmintic, stomachic, febrifugal and tonic properties. It is used for treating amoebic dysentery and diarrhoea, usually administered as a decoction. The bark is used alone in the form of a decoction or in combination with other astringent drugs in the treatment of piles, dyspepsia, colic and diuresis. It is also used for skin and spleen diseases. The powdered bark is used by the Agaris and Bhils of Maharashtra to treat asthma. A decoction of the stem bark is given orally to treat coughs and colds among the Santhalis in southern Bihar. The Gonds of Uttar Pradesh reportedly use the powdered stem bark for curing swelling of the body, and its decoction for relief of malarial fever. A hot decoction of the bark is used as a gargle to relieve toothache. In Orissa the latex from the plant is used externally to treat eczema and other skin diseases. The leaves are used in the treatment of chronic bronchitis and for relieving boils and ulcers. A powder prepared from the roots and leaves is used to stop haemorrhages after childbirth and to control nosebleeds. The flowers are reportedly eaten as a cooked vegetable to relieve coughs and colds in Rajasthan.

References

Aminuddin and Girach (1991), Asolkar *et al.* (1992), Chatterjee and Pakrashi (1995), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Girach (1992), Girach and Aminuddin (1995), Jadeja (1999), Jain *et al.* (1989), Joshi (1989), Kirtikar *et al.* (1935), Nadkarni (1954), Singh and Prakash (1994), Sivarajan and Balachandran (1994), Upadhye *et al.* (1994), Varma (1997), Yoganarasimhan (1996).

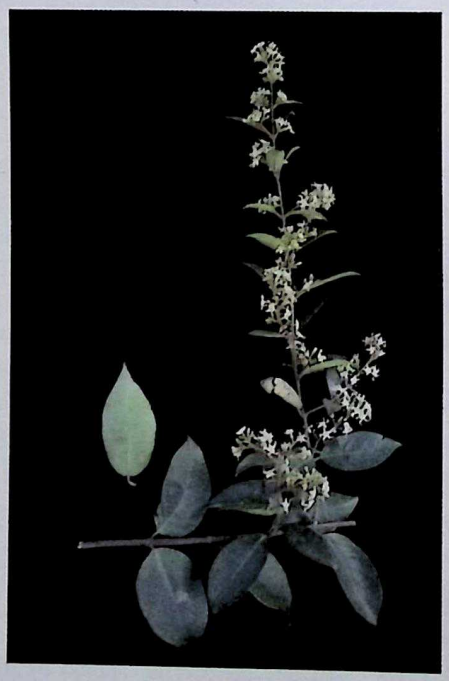
Ichnocarpus frutescens (L.) Br.

Botanical synonyms

Apocynum frutescens L., *Echites frutescens* (L.) Roxb.

Common names

Bengali: dudhi, shyamalata, syamalota; ***English***: black creeper; ***Hindi***: dudhilata, kalidudhi, siamalata; ***Kannada***: gorwiballi, haalu genasu, karihambu; ***Konkani***: kantebhouri, ***Malayalam***: palvalli; ***Marathi***: kantebhouri, krishnasarwa; ***Oriya***: madhobi, soyamnoi, syamolota; ***Sanskrit***: sariva, shariva, syamalata; ***Tamil***: illukatte, paravalli, udargodi; ***Telegu***: illukatte, nellateaga, muntgajjanamu.



Description

A large, evergreen, much-branched woody climber with rusty-tomentose branches. Leaves opposite, elliptic-oblong to broadly lanceolate, 2.5–10 cm long and 1.2–5 cm wide, coriaceous, softly tomentose beneath and glabrous above, pubescent when young, apex acute, base rounded or obtuse; petioles 0.3–0.8 cm long. Flowers fragrant, greenish-white or purplish, corolla lobes narrow, twisted and bearded, borne in axillary or terminal panicles of cymose clusters. Fruits (follicles) cylindrical, slender,

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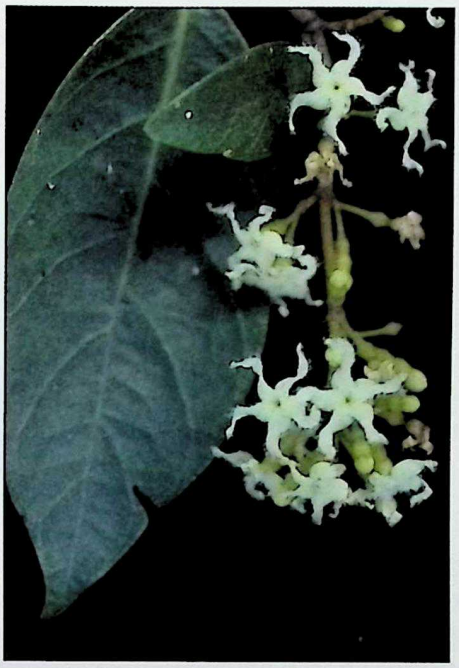
curved, usually paired, 10–15 cm long and 4 cm wide, rusty-pubescent at first, later glabrous. Seeds slender, white with a coma, 1.2–1.7 cm long. In central Indian deciduous forest areas, leaves turn reddish-brown before falling in February, with new leaves appearing in March–April. In this region flowering occurs from October to December and fruiting from February to April.



Distribution and habitat

Found almost throughout India to an altitude of 1200 m from the western Himalayas southwards to Tamilnadu and Kerala to Sri Lanka, and eastwards through Southeast Asia to northern Australia. It is typically found in village surroundings and hedges.

Medicinal properties and uses

The roots are used in traditional medicine as a substitute for, or sometimes mixed with, those of Indian sarsaparilla (from *Hemidesmus indicus*: *Asclepiadaceae*). They possess a sweetish astringent taste but lack the characteristic odour of Indian sarsaparilla. They reportedly possess demulcent, alterative, tonic, diaphoretic and diuretic properties and are used to treat fevers, dyspepsia and skin diseases, usually in combination with bitters and aromatics. The root powder, administered with milk, is used in the treatment of diabetes, gall bladder stones, and as a blood-purifier. Among the tribal inhabitants of eastern Bihar, it is given in the treatment of filariasis. A decoction of the leaves and stalks, or of the roots and leaves, is used to treat fevers. The leaves are boiled in oil and applied for relief of headaches and fevers, as well as wounds between fingers.

References

Asolkar *et al.* (1992), Chatterjee and Pakrashi (1995), Chopra *et al.* (1956), CSIR (1948–1992), Jha and Varma (1996), Kirtikar *et al.* (1935), Nadkarni (1954), Ragupathy and Mahadevan (1991), Sivarajan and Balachandran (1994), Yoganarasimhan (1996).

Nerium indicum Mill.

Botanical synonyms

Nerium odorum Sol., *N. oleander* L.

Common names

Bengali: karabi, karavi; ***English***: Indian oleander, sweet-scented oleander; ***Gujarati***: kagaer, kanera, kanher; ***Hindi***: kaṇer, karabera, karber, kuruvira; ***Kannada***: kanagalu, kanagilu, paddale; ***Konkani***: dhavekaneri; ; ***Malayalam***: arali, areli, kanaviram, karaviram; ***Marathi***: kaneri, kanher; ***Oriya***: konero, korobiro; ***Punjabi***: ganera, kaner, kaneri; ***Sanskrit***: asvamaraka, chandata, karavira, kayamaraka; ***Tamil***: alari, arali, kanaviram, karaviram; ***Telegu***: ganneru, karaviram, kastoori, pattelu; ***Urdu***: kanir.

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Description

A large, erect, evergreen shrub up to 5 m tall. Leaves mostly in whorls of 3, linear-lanceolate, acuminate, thickly coriaceous, shiny above with a stout midrib. Flowers sweet-scented, white, pink or red, borne in terminal cymes, fragrant. Fruit (follicle) straight, cylindrical, hard, green, glabrous, 15–23 cm long, containing numerous small seeds tipped with a coma of light brown hairs. In central Indian deciduous forests, flowers in November and December and fruits in March and April.

Distribution and habitat

Found wild in the Himalayas from Nepal westwards to Kashmir and Afghanistan up to about 2000 m, in the upper Gangetic plain and in Madhya Pradesh. Cultivated in gardens throughout India for its showy flowers; occasionally naturalized in rocky beds of streams and ravines.

Medicinal properties and uses

The roots constitute the Ayurvedic drug *Karavirah*, well known as a poison but, under careful administration, used as a powerful cardiac tonic. It is considered bitter, hot, astringent, anthelmintic, carminative, diaphoretic and useful as an external application as a powerful resolvent and attenuant for treating ulcers, leprosy and skin diseases. Its paste is used externally for the treatment of haemorrhoids, cancers, ulcerations and leprosy. In Unani practice, the root is considered a good tonic for chronic pain in the abdomen and joints. The flower is also used in Unani medicine to treat inflammations, chronic muscular and joint pain, lumbago, headache and scabies. In Siddha, the root bark and flowers are used for treating leprosy, skin diseases, glandular swellings and poisoning. A paste of the leaves and the oil extracted from the root bark is used to treat ringworm and other skin diseases. A decoction of the leaves is used as an inflammatory agent. The leaf juice is applied to syphilitic ulcers; fresh juice of young leaves is sometimes used to treat ophthalmia.

Warning

The roots, bark and seeds contain cardioactive glycosides. All parts of the plant are poisonous and should not be taken internally.

References

Chatterjee and Pakrashi (1995), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935), Nadkarni (1954), Sivarajan and Balachandran (1994), Yoganarasimhan (1996).

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Plumeria acuminata Ait.

Botanical synonyms

Plumeria acuminata Ait., *P. acutifolia* Poir., *P. rubra* L. var. *acutifolia* Bailey

Common names

Bengali: dalanaphula, dalan. phul, gorur champa; ***English***: frangipani, jasmine tree, pagoda tree; ***Gujarati***: rhada champo; ***Hindi***: chameli, champa, goburchampa, golainchi; ***Kannada***: belchampaka, deva ganigile, kadu sampage; ***Konkani***: portugalo champo; ***Malayalam***: arali, ezha-champakam, velachampakam, velatahri; ***Marathi***: khair champa, rhuruchapha, son champa; ***Oriya***: golochi, kat champa, torato; ***Sanskrit***: devaganagalu, devaganagulu, gosampige, kshira, kshiracampaka, svetacampaka; ***Tamil***: arali, kallimandharai, perungalli; ***Telegu***: nuru varahaalu, vaada ganneru, vadaganeru; ***Urdu***: achin.

Description

An evergreen or semi-deciduous tree up to 7 m tall, with a crooked trunk, rough bark and swollen, fleshy branches. The bark and branches yield a copious latex when cut. Leaves oblanceolate or elliptic, 15–30 cm long, borne at the ends of branches. Flowers highly fragrant, large, cream-coloured or white with yellow centres, sometimes pink-flushed outside, in terminal cymes. Fruits (follicles) divaricate, linear-oblong or ellipsoid, brownish-black; seeds oblong, winged, with pappus. Flowers almost throughout the year; rarely fruits.

Distribution and habitat

Considered to be native to the American tropics from Mexico to Panama, introduced and occasionally naturalized in many tropical countries, including throughout India, where it is grown, often near temples, as an ornamental and for its fragrant flowers, used in garlands and in perfume-making.

Medicinal properties and uses

Many parts of the plant are considered medicinal. In Ayurveda, the therapeutic properties are the same as those of *Michelia champaca* (*Magnoliaceae*). A decoction of the bark, regarded as a stimulant, is used as a purgative, emmenagogue and febrifuge. Given with coconut, *ghee* (clarified butter) and rice, it is used to relieve diarrhoea. It is sometimes used to treat dropsy and venereal diseases. The root bark is reported to be a powerful purgative and antiherpetic, sometimes used to treat venereal sores and, in Unani practice, to treat tumours and rheumatic pains. The latex of the plant has rubifacient and purgative properties, and is an ingredient of

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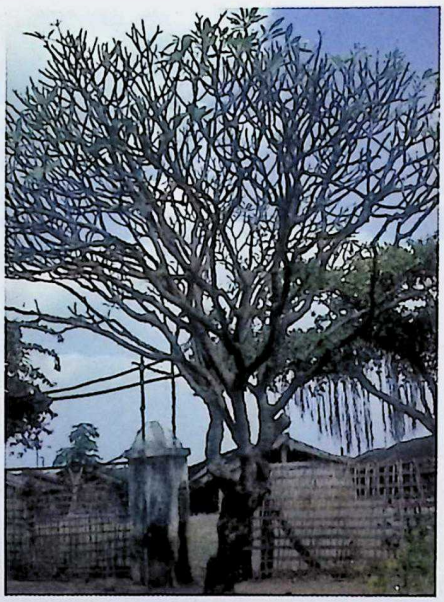
external applications used to relieve itches, rheumatism and gum problems. The flowers are considered contraceptive. The leaves are used as a febrifuge and, in the form of a paste, are applied as a poultice to relieve indolent swellings and as a rubifacient for rheumatism.



Warning

Excessive doses of the latex are poisonous, and the root is a violent cathartic.

References

Chatterjee and Pakrashi (1995), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

Plumeria alba L.

Common names

Bengali: goruchampa; ***English***: frangipani, white champa, white frangipani; ***Gujarati***: rhachampo; ***Hindi***: gulchin; ***Kannada***: haalusampige, kadusampige; ***Malayalam***: simaiyalari, vella champakam, velutharali; ***Marathi***: khair champa; ***Oriya***: kalchampa; ***Sanskrit***: kananakaravira; ***Tamil***: peru, perumal arali, perungalli; seemi arali; ***Telegu***: adavi-ganneru, veyvi varahaalu, veyyivarahalu.

Description

A small evergreen tree up to 4.5 m tall with swollen, fleshy branches. Leaves borne in clusters at the ends of branches, lanceolate to oblanceolate, with very prominent venation, tomentose beneath. Flowers white with a yellow centre, fragrant, borne in corymbose fascicles.

Distribution and habitat

Native to the West Indies, introduced to India as a garden ornamental, particularly in the south.

Medicinal properties and uses

The root bark is considered purgative, alterative and detergent. It is used to treat blennorrhagia and herpes. In the form of

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an extract it is used internally and externally for treating syphilitic ulcers. The seeds are said to possess haemostatic properties. Other medicinal uses are almost the same as those of *Plumeria acuminata*.

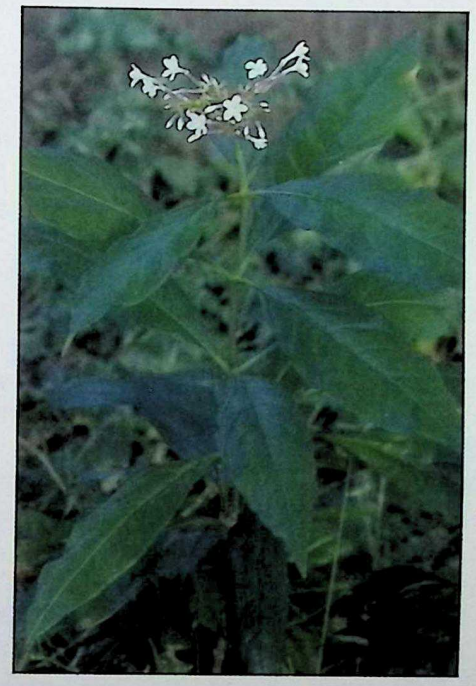
References

Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Nadkarni (1954), Yoganarasimhan (1996).

Rauvolfia serpentina (L.) Benth. ex Kurz

Botanical synonyms

Ophioxylon album Gaertn., *O. serpentinum* L., *O. trifoliatum* Gaertn., *Rauvolfia trifoliata* (Gaertn.) Baill.



Common names

Bengali: chandra, chhotachand, sarpagandha; ***English***: rauvolfia, serpentina, serpentine root, snake root; ***Hindi***: chandrabhaga, chhota-chand, chota chand; ***Kannada***: chandrike, patalagandhi, sarpagandhi, shivanabhiballi, sutranavi; ***Konkani***: patalagarud; ***Malayalam***: chuvannavilpuri, suvapavalporiyan, tulunni; ***Marathi***: harkaya, harki, sapasanda; ***Oriya***: dhanbarua, dhanmarna, dhannerna, patalgarur, sanochado; ***Sanskrit***: chundrika, nakuli, sarpagandha; ***Tamil***: chivanamelpodi, covannamiloori, sovannamilbori; ***Telegu***: dumparasna, palalagani, patala-gandi, patalagaruda.

Description

An erect, evergreen sub-shrub, 0.2–0.6 m tall, stem usually unbranched, with irregularly longitudinally fissured, pale brown, corky bark. Taproot tuberous, soft, sometimes irregularly nodular, bitter. Leaves in whorls of 3 or 4, rarely opposite, 5–18 cm long and 1.5–7 cm wide, elliptic-lanceolate or obovate, apex acute or acuminate, base tapering, dark green above, pale green below; petioles 0.6–1.4 cm long. Flowers white or violet-tinged, borne in many-flowered irregular corymbose cymes; peduncles 0.5–12.5 cm long; pedicels stout, 0.3–0.6 cm long, bright red; calyx bright red with lanceolate segments; corolla 1–1.3 cm long; tube slender, cylindrical. Fruit (drupe) obliquely ovoid, 0.6 cm in

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diameter, purplish-black when ripe; seeds (pyrenes) ovoid, slightly rugose. Flowers mainly from April to July and fruits from July to September, although flowering and fruiting may occasionally occur year-round.

Distribution and habitat

An Indo-Malaysian species native to India, sub-Himalayan Pakistan, Bangladesh, Sri Lanka, Myanmar (Burma), Thailand, Malaysia and Java. In India it is widely distributed, though rarely common, in secondary scrub and grassy habitats in the sub-Himalayan hills from Punjab eastwards to Nepal, Sikkim, Bhutan and Assam, in the lower hills of the Gangetic plains, some parts of central India, Eastern and Western Ghats, and in the Andaman Islands; in the Western Ghats it is found in moist forests up to 900 m. It is usually found widely scattered in the shaded understorey of moist deciduous forests as well as in open, secondary scrub forest and grassy, usually moist habitats on a variety of soils from sea level up to 1200 m altitude, generally on sites that were previously inhabited, including many ancient sites. An estimated 400–500 tonnes of rauvolfia roots are harvested annually in India, Bangladesh, Sri Lanka and Thailand. Although the species is cultivated in medicinal plant gardens, its over-exploitatation has brought the species to the brink of extinction in the wild.

Medicinal properties and uses

One of the best-known plant drugs in the world, the roots and their major alkaloidal constituents, notably reserpine, rescinnamine and deserpidine, have been extensively researched in India, Europe and North America and are widely used in the treatment of high blood pressure and as a sedative and tranquillizing agent. The roots have been used for centuries in Ayurvedic and Unani medicine as a hypnotic and sedative, for reducing high blood pressure, and for treating various central nervous system disorders, both psychic and motor, including anxiety, psychosis, schizophrenia, epilepsy and insomnia. Among the tribal inhabitants of southern and eastern Bihar, the powdered roots are given orally as an antidote to snake venom. Extracts of the roots are valued for treatment of intestinal disorders, particularly diarrhoea and dysentery, and also as an anthelmintic. Mixed with other plant extracts, they have been used for treating cholera, colic and fever. A decoction of the root is believed to stimulate uterine contractions and is recommended for use in difficult cases of childbirth. The juice of the leaves has been used as a remedy for opacity of the cornea. Among the Kondhs of southwest Orissa, a drug prepared from the dried fruit, black pepper and ginger is used to regularize menstruation.

References

Chatterjee and Pakrashi (1995), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Girach (1992), Jha and Varma (1996), Kirtikar *et al.* (1935), Monachino (1954), Nadkarni (1954), Shah (1995), Sivarajan and Balachandran (1994), Varma (1997), Yoganarasimhan (1996).

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Rauvolfia tetraphylla L.

Botanical synonyms

Rauvolfia canescens L., *R. tomentosa* Jacq.

Common names

Bengali: bara-chandar; ***Hindi***: bara-chandrika.

Description

A small, much-branched woody shrub, 0.6–1.2 m high. Leaves whorled, ovate-elliptic. Flowers greenish-white or creamy-white in umbellate cymes. Fruits (drupes) ovoid, deep red or purple when ripe; seeds oblong, rugose. Flowers and fruits almost throughout the year.

Distribution and habitat

Native to the West Indies and introduced to India, where it is cultivated in gardens from Uttar Pradesh to West Bengal southwards to Tamilnadu and Kerala. It has become naturalized in many localities and is a common weed in warm, moist habitats in the vicinity of coastal ports and elsewhere in the country where it has been cultivated.

Medicinal properties and uses

The roots are hypotensive and often used as a substitute for, or adulterant of, those of *Rauvolfia serpentina*, although they reportedly contain relatively low concentrations of the alkaloid reserpine, one of the most potent and valued constituents of *R. serpentina* roots. An extract of the plant mixed with castor oil is prescribed as a liniment to treat certain chronic and refractory skin ailments. In parts of the West Indies a decoction of the bark is used as an external application for chronic skin diseases and to destroy parasites.

Warning

The plant is reported to be poisonous, causing mouth pain, restriction of the pharynx, burning sensation in the stomach and intestines, vomiting, dyspnoea, haemorrhagic diarrhoea, weak but quickened and irregular pulse, intense thirst and dysuria and finally death by convulsions and coldness of the extremities. The fruit is known to cause violent, usually fatal, alimentary inflammation.

References

Chatterjee and Pakrashi (1995), Chopra *et al.* (1956, 1969), CSIR (1948–1992).

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Tabernaemontana divaricata (L.) Br.

Botanical synonyms

Ervatamia coronaria (Jacq.) Stapf, *Nerium coronarium* Jacq., *N. divaricatum* L., *Tabernaemontana coronaria* (Jacq.) Willd.

Common names

Bengali: chameli, tagar, tagur; ***English***: East India rosebay; ***Gujarati***: sagar, tagar; ***Hindi***: chandni, tagar; ***Kannada***: kottuhale, nandi batla hoovu, nandibatlu; ***Konkani***: vadli namdit; ***Malayalam***: kuttampale, nantiyavattam, nantyarvattam, takaram; ***Marathi***: ananta, gondetagara, sagar, tagar; ***Oriya***: kato-katochampa, molli phulina, togoro; ***Sanskrit***: nandivriksha, nandyavartah, tagar, tagara; ***Tamil***: adukkunandiyavattai, kuruduppalai, nandiyavattam; ***Telegu***: gandhitagarapu, nandivardanam, nandivardhanamu.

Description

A small evergreen shrub up to 2.5 m high with silvery-grey bark and handsome foliage. Leaves opposite, unequal, elliptic or elliptic-lanceolate, 7.6–15.2 cm long, apex acuminate, smooth and glossy green above, pale green below. Flowers white, often double, sweetly fragrant (at night only), borne solitary or in few-flowered cymes; corolla tube swollen below the middle, lobes obliquely ovate, obtuse, margins curled. Fruits (follicles), usually rare, are curved, beaked, 1–3-ribbed, 2.5–7.6 cm long and 1 cm wide, orange or bright red within, containing 3–6 seeds *c.* 7.5 mm long, embedded in a red fleshy aril. Flowers almost year-round.

Distribution and habitat

Considered to be indigenous to India but widely distributed in the tropics, it is found in forests and hedges throughout the sub-Himalayan hills from Garhwal eastwards to Assam, extending southwards to the North Circar hills and Vizagapatam in Andhra Pradesh. Cultivated in gardens for its ornamental and fragrant flowers.

Medicinal properties and uses

In Ayurvedic practice, the flower buds of this plant are used to treat eye diseases. The juice of the flowers, mixed with oil, is applied externally to relieve the burning sensation in sore eyes and for relief of some skin diseases. The milky juice of the leaves is used as a cooling application for wounds and to reduce inflammation; it is also used to treat ophthalmia. The acrid, bitter root is used as a local anodyne and chewed to relieve toothache. The powdered root, mixed with that of *Achyranthes aspera* (*Amaranthaceae*), is used as a tooth powder to treat dental caries (tooth decay) and pyorrhoea among the tribal inhabitants of southern Andhra Pradesh. Rubbed into a thin paste with water, the root bark is taken internally as a vermicide. It is also applied with lime juice to clear opacity of the cornea. The wood is considered cooling.

References

Chatterjee and Pakrashi (1995), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Nadkarni (1954), Rao *et al.* (1996), Sivarajan and Balachandran (1994).

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Vallaris solanacea (Roth) O. Kuntze

Botanical synonyms

Peltanthera solanacea Roth., *Vallaris heynei* Spreng.

Common names

Bengali: haparmali, ramsar; ***Hindi***: chamarikivel, dudhibel, ramsar; ***Kannada***: bugadi, bugudi hambu; ***Oriya***: bonokonerinoi, hapormoli; ***Sanskrit***: bhadramunja, bhadravalli, visalayakrit; ***Tamil***: puttapodara-ejarala; ***Telegu***: jookamallechettu, madhumaalati, nityamalle, pallamalletivva, puttapodarayarala.

Description

A large, handsome, deciduous, woody climber; old stems with pale corky bark, branches ash-coloured. Leaves opposite, elliptic, oblong or linear-oblong, apex shortly acuminate, pellucid-dotted, 4–10 cm long. Flowers creamy-white, fragrant, saucer-shaped in drooping, 3–10-flowered axillary cymes. Fruits (follicles) green, glabrous, cylindrical, tapering to a blunt point, 10–15 cm long, containing beaked or acuminate, ovate, seeds. In central Indian deciduous forest areas flowering occurs from March to July and fruiting from November to January.

Distribution and habitat

Found in the tropical Himalayas to an altitude of 1500 m, and in deciduous forests and hedges in peninsular India. Often cultivated in gardens for its scented flowers.

Medicinal properties and uses

The milky sap or latex of the plant is a mild irritant and is applied to promote healing of wounds and old sores. It is also a popular remedy for toothache and inflamed gums. The bitter, astringent bark is used as a purgative and as an ingredient of the Ayurvedic preparation known as *Vishagarbha taila*. Ayurvedic physicians in Kerala use this species as the source of the drug *Visanika* (usually equated with *Gymnemna sylvestre*: *Asclepiadaceae*) to treat a variety of conditions and diseases.

References

Chatterjee and Pakrashi (1995), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935), Nadkarni (1954), Sivarajan and Balachandran (1994), Yoganarasimhan (1996).

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Wrightia arborea (Dennst.) Mabb.

Botanical synonyms

Periploca arborea Dennst., *Wrightia hamiltoniana* Wallich, *W. tomentosa* (Roxb.) Roem. & Schult., *W. wallichii* A. DC.

Common names

Bengali: dudhi, dudhkaravi, dudhkoraiya; ***Gujarati***: dudhlo, kala inderjau, rucchalodudhalo; ***Hindi***: daira, dharauli, dudhi; ***Kannada***: bilikudegidda, billiganagalugidda, kadujanagalu, kadunagalu, ruchhalodudhalo; ***Malayalam***: mailam pala, mayilapala, nettampala, nilampala, thouthapala; ***Marathi***: kalainderjau, tamdakura; ***Oriya***: dudhokrya, harido, kudelo, pahukrya, pal kurwan; ***Punjabi***: dudhi, keor, kilawa; ***Sanskrit***: kutaja, kutajah, kutajastri; ***Tamil***: pala, palai, sonaivetpalai, thondthapala, tondambalai, vetpalai; ***Telegu***: koilamukri, kolamukhi, peddapaala, tellapaala.

Description

A small to medium-sized deciduous tree up to 20 m tall with slender, rough, opposite, divaricate branches. Bark greyish-yellow to rust-coloured, corky, with light specks, yielding abundant milky sap when cut. Leaves opposite, elliptic to broadly obovate, caudate-acuminate, often softly, densely tomentose, 6–18 cm long and 3–8 cm wide, with 6–15 pairs of conspicuous secondary veins; petioles 0.3–0.8 cm long. Flowers pale yellow or pinkish with orange scales on the corona, borne in many-flowered corymbose cymes. Fruits (follicles) paired, linear, erect, 15–30 cm long, connate into a grooved, pendant, cylindrical pod covered with rough tubercles; seeds with a silky white coma. Flowers and fruits from March to July and fruits from December to February throughout most of peninsular India.

Distribution and habitat

Occurs naturally in India and Sri Lanka westwards to Myanmar (Burma), Thailand, southern China, Laos and Vietnam. Found throughout the warmer regions of India to an altitude of 600 m in the Himalayas and to 1200 in the Nilgiris in southern India; also planted as an ornamental in gardens. In central India this species is much less common than *Wrightia tinctoria*.

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Medicinal properties and uses

The leaves are taken with salt to relieve toothache. The root bark is used as a substitute for that of *Holarrhena antidysenterica*, known as *Kutajah* in Ayurvedic practice, to treat chronic dysentery and diarrhoea, piles, haemorrhage, indigestion and skin diseases. In Chota Nagpur, a preparation made from the bark is considered useful for treating menstrual and renal complaints. The leaves are sometimes eaten as a pot-herb.

References

Chatterjee and Pakrashi (1995), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Sivarajan and Balachandran (1994).

Wrightia tinctoria Br.

Common names

Bengali: indarjou, indrajau; ***English***: sweet indrajao; ***Gujarati***: dudhlo, indrajou, kalikari, mitaindrajawatunjha, runchallo-dudhlo; ***Hindi***: dudhi, indrajau, khirni, mitha indarjau; ***Kannada***: bepalle, hallunovu, kirikodasige, kodamurki, kodesige; ***Konkani***: kalokuddo; ***Malayalam***: aiya pala, ayyapala, ichcha, irumpala, kotakappala; ***Marathi***: godaindrajau, indrajou, kalakuda, kalakudu; ***Oriya***: dudhokriya, krya, pita karuan; ***Sanskrit***: hyamaraka, kutaja, svetakutaja; ***Tamil***: irumpalai, nila palai, thonthapalai, veppalai, vetpalai, vetpala-verai, veypale; ***Telegu***: amkuda, ankuda, jeddapala, tella pala.

Description

A small deciduous tree up to 7.5 m high with smooth, light grey, scaly bark and yellow or light brown branchlets. Leaves elliptic-lanceolate, obtusely acuminate, 7.5–12.5 cm long. Flowers white, fragrant, borne in lax terminal cymes to 12 cm long,

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with slender spreading branches; bracts minute, ovate; calyx glabrous, glandular inside, segments 2.5 mm long, oblong, rounded at the apex; corolla tube 3 mm long, lobes 8 mm long, oblong, obtuse, corona of numerous linear scales. Fruits consist of distinct, paired, slender, cylindrical follicles with adhering tips, 15–50 cm long; seeds linear, glabrous, with a basal coma. In central Indian deciduous forests, flowers between March and May; fruits develop in November, remaining on the trees before dehiscing in April; trees usually leafless between December–January and March–May.

Distribution and habitat

Widely distributed from Rajasthan to Madhya Pradesh southwards to Tamilnadu in deciduous forests on dry, sandy soils, often along streams.

Medicinal properties and uses

The seeds are considered anthelmintic, antidiarrhoeal, antidysenteric, astringent, febrifuge and tonic. They are used to treat flatulence and seminal weakness. The bark is considered anthelmintic; it is a common substitute for *kurchi* bark (from *Holarrhena antidysenterica*: *Apocynaceae*) in both Ayurvedic and Unani medicine. A decoction of the bark and leaves is used as a febrifuge, stomachic and tonic. The fresh leaves are very pungent and are chewed to relieve toothache. Alcoholic extracts of the leaves and roots possess hypotensive properties. The root bark is used as a substitute for that of *Holarrhena antidysenterica* in Ayurvedic practice to treat chronic dysentery and diarrhoea, piles, haemorrhage, indigestion and skin diseases. The crushed roots are used by the Kathodias to induce vomiting. A paste made from the ground bark, root and fruit is used to expel threadworms; for infants, it is taken by their breast-feeding mothers; for older children it is given orally.

References

Brahmam and Saxena (1990), Chatterjee and Pakrashi (1995), Chopra *et al.* (1956), CSIR (1948–1992), Joshi (1989), Kirtikar *et al.* (1935), Nadkarni (1954), Sivarajan and Balachandran (1994).

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Araceae

Acorus calamus L.

Botanical synonym

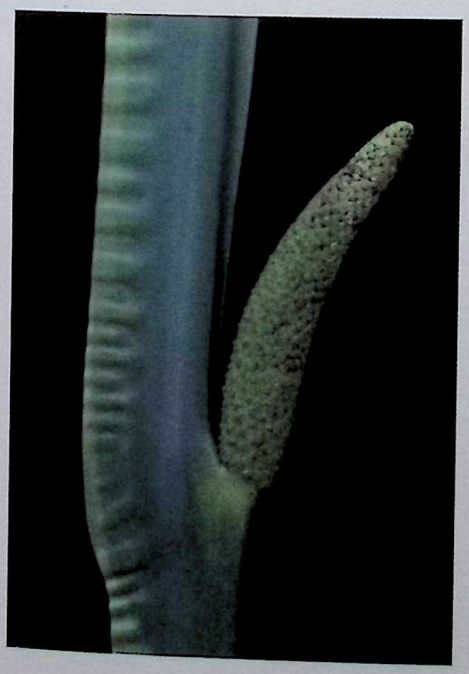
Acorus calamus var. *verus* L.

Common names

Bengali: bach; ***English***: calamus, sweet flag, sweet root; ***Gujarati***: gandhilovaj, godavaj, vekhand; ***Hindi***: bach, gorbach, vach; ***Kannada***: bajai, baje; ***Konkani***: ekhanda; ***Malayalam***: vashanpa, vayambhu, vayampa, vayampu; ***Marathi***: vekhand, verkhand; ***Oriya***: bacha; ***Punjabi***: bariboj, wach; ***Sanskrit***: bhadra, ugragandha, vaca, vacha; ***Tamil***: vashambu; ***Telegu***: vadaja, vasa, vasa vadaja.

Description

A strongly aromatic semi-aquatic perennial herb; rhizomes creeping, jointed, somewhat vertically compressed, 1.3–2.5 cm thick, pale to dark brown and spongy inside. Leaves narrow, up to 80 cm long, linear to narrowly ensiform, glossy bright green, apex acute, base amplexicaul; petioles sheathing for 20–50 cm. Flowers pale



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green, fragrant, arranged compactly on a sessile, cylindrical, stumpy spadix 5–7 cm long. Fruits (berries) green, angular, 3-celled, fleshy, containing 1–3 oblong seeds.

Distribution and habitat

Native to Europe, cultivated and sometimes naturalized throughout India, Myanmar (Burma) and Sri Lanka. Common in moist or marshy habitats betweeen 300 and 2000 m elevation in the Himalayas.

Medicinal properties and uses

The dried rhizomes comprise the commercial drug *Calamus*, used in Europe since the time of Hippocrates. In Ayurveda they constitute the drug *Vaca*, considered to have antispasmodic, carminative and anthelmintic properties and to be capable of improving memory and intellect. It is used in various forms (as a powder, balm, enema or pills) to treat a wide variety of diseases and conditions, including epilepsy and other mental ailments, chronic diarrhoea and dysentery, bronchial catarrh, intermittent fevers, and glandular and abdominal tumours, liver and kidney ailments, flatulent colic, chronic dyspepsia, rheumatism and eczema. The rhizomes are an ingredient in many compound Ayurvedic and other traditional medicinal preparations. The rhizomes, roots and leaves yield a light brown to brownish-yellow volatile oil known as *Calamus oil*, credited with carminative, antispasmodic and antibacterial properties. Among the Gonds of Uttar Pradesh, the root bark, taken together with black pepper, is reportedly used as an antidote for snake bites.

Warning

The rhizome is emetic in large doses; under certain conditions it may cause disturbed digestion and, in severe cases, gastroenteritis.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Jha and Varma (1996), Kirtikar *et al.* (1935), Kumar and Jain (1998), Nadkarni (1954), Sivarajan and Balachandran (1994), Yoganarasimhan (1996).

Pothos scandens L.

Botanical synonym

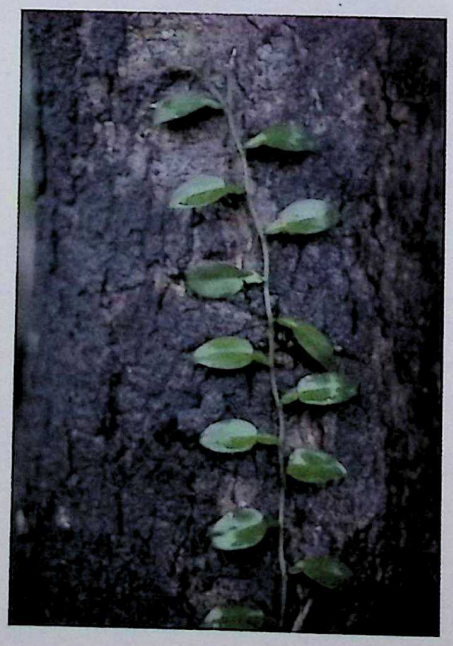
Pothos zeylanicus Dassow

Common names

Kannada: adikabiluballi; ***Malayalam***: anapparuva, paruvakodi; ***Tamil***: anaparuga.

Description

A much-branched climber with adventitious aerial roots; internodes 1.3–2.5 cm. Leaves very variable, 5–10 cm long and 0.8–5 cm wide, obovate, elliptic or lanceolate, coriaceous, bright green, apex acute, acuminate or apiculate, base cuneate or rounded; petioles semi-amplexicaul, broadly winged, 2.5–7.5 cm long and 0.6–1.7 cm wide at the base. Spathe green,



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0.4–0.7 cm long, ovate and erect, apex cuspidate; stipe deflexed, to 0.6 cm long; spadix yellow, approximately 0.5 cm long and wide, globose, ovoid or shortly oblong. Fruits (berries) oblong, 1.3–1.7 cm long, scarlet when ripe.

Distribution and habitat

Native to the Indo-Malaysian region and Madagascar. Found on rocks, walls and tree trunks in moist and wet forests in northeastern, central and southern India, in the Andaman and Nicobar Islands and Sri Lanka.

Medicinal properties and uses

The bruised root, fried in oil, is reportedly applied to promote healing of abscesses. An infusion of the leaves is reportedly used as a bath for curing convulsions and epilepsy. The powdered leaves are applied to the body as a cure for smallpox in Malaysia. The stem, cut up with camphor and smoked like tobacco, is reportedly used to treat asthma.

References

Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

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Araliaceae

Schefflera venulosa (Wight & Arn.) Harms

Botanical synonyms

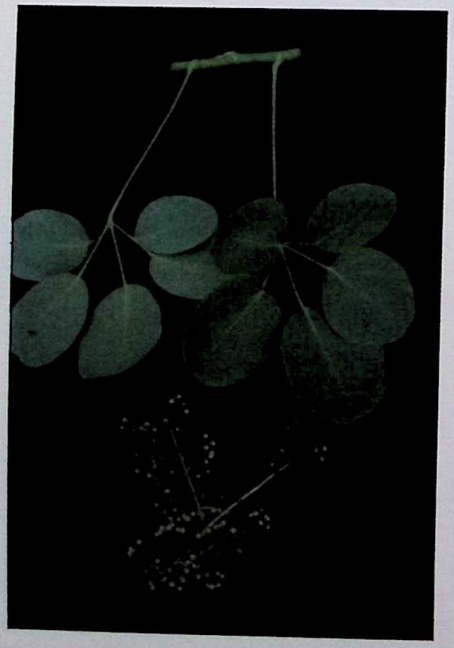
Heptapleurum venulosum Seem., *Paratropia venulosa* Wight & Arn.

Common names

Bengali: ban-simar; ***Hindi***: dain, kath-semul, karbot semul; ***Kannada***: bili bhuthala, huli-pachkiballa, tengar-bali; ***Marathi***: rawanito; ***Oriya***: jari; ***Tamil***: modakama.

Description

A soft-wooded climber or stout epiphytic shrub with adventitious roots; young branches tomentose. Leaves alternate, palmately compound, 7.5–19 cm long and up to 9 cm wide, petioles 8–23 cm long; leaflets 5–7, elliptic-oblong, shortly acuminate at apex, veins prominent, petiolules 2.5–5 cm long. Panicles 25 cm long; umbels 2 cm across; flowers yellowish-green or cream-coloured or pink, with



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peduncle to 2 cm long. Fruit rounded, 5-ribbed, brownish-black, to 0.6 cm in diameter. In central India flowers between March and April and fruits in May and June; in Karnataka, flowers from April to June and fruits during the rainy season.

Distribution and habitat

Throughout most of tropical and subtropical India, Myanmar (Burma) and Indochina to an altitude of 1800 m. Typically found on trees near villages in peninsular India; common in moist deciduous and evergreen forests of the eastern slopes of the Western Ghats.

Medicinal properties and uses

The roots, mixed with rice, are eaten by the Mundas as a remedy for dropsy. A warm paste of the bark, leaves and twigs is applied externally to relieve swellings by the inhabitants of the Gandhamardan Hills in Orissa; a bath prepared by boiling the twigs is also used in this region to relieve rheumatic pains.

References

Brahmam and Saxena (1990), CSIR (1948–1992), Yoganarasimhan (1996).

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Arecaceae

Areca catechu L.

Common names

Bengali: gua, supari; ***English***: areca palm, betel-nut palm; ***Gujarati***: sopari; ***Hindi***: supari; ***Kannada***: adike, adike mara, betta, chikaniyadike, puga; ***Konkani***: fufal, maddi, supari; ***Malayalam***: adakka, adakkamarom, kavungu, kazhangu; ***Marathi***: pophali, pung, supari; ***Oriya***: gua, pugo, supari, trinodrumo; ***Punjabi***: supari; ***Sanskrit***: gubak, guvaka, kramuka, poogiphalam, puga, tantusara; ***Tamil***: kamugu, paakkumaram, pakku, pugam; ***Telegu***: gautupoka, kolapoka, oppu-vakkulu, poka-vakka, vakka; ***Urdu***: supari.

Description

A tree with a straight smooth stem, the upper portion green, annulate, 12–30 m tall. Leaves pinnate, 1.2–1.8 m long; leaflets numerous, 30–60 cm long; petiole expanded into a broad, tough sheath. Spathe double, compressed, glabrous, spadices much-branched, bearing male and female flowers; male flowers small, numerous, sessile; female solitary or in groups of 2–3, borne near the base of each ramification of the spadix. Fruit ovoid or oblong, 4–5 cm long, smooth, orange or red when fully ripe, single-seeded, with a fibrous mesocarp; seed-kernel (*'betel-nut'*), 2–4 cm in diameter, greyish-brown, ruminate with reddish-brown lines.

Distribution and habitat

Native to the Indo-Malayan region. Although not known to be truly wild in India, it is widely distributed in the coastal regions from Maharashtra to Kerala and Tamilnadu, in the Deccan Plateau of south-central India, and in Assam, Meghalaya, West Bengal, the Andaman and Nicobar Islands, and in Sri Lanka. It is cultivated for its commercially important seed kernels.

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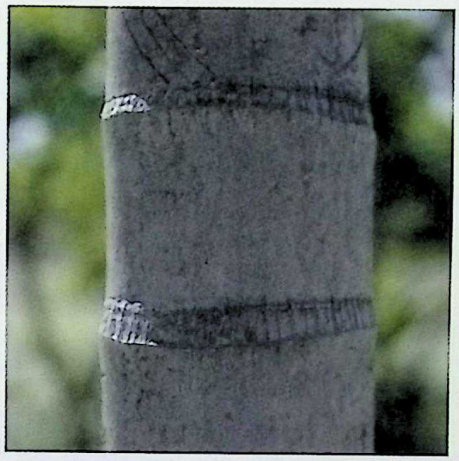
Medicinal properties and uses

Betel-nuts are extensively used throughout South Asia as an appetizer and digestive; they are chewed either alone or with betel leaves (*Piper betle*: *Piperaceae*), lime paste, spices such as cloves and other ingredients; they are said to sweeten the breath, strengthen the gums and act as a stimulant. The juice of the tender fruits is used as a laxative. The powdered nuts are prescribed in the treatment of diarrhoea and urinary disorders; they are reportedly aphrodisiac. They are considered useful as an external application for ulcers and skin diseases. A paste of the dry betel-nut powder is used as a dentifrice. In Ayurveda the fruit is used to treat polyuria, gynaecological disorders, haemorrhage and diseases of the nervous system. In Siddha, both the roots and seed kernels are used medicinally. In Unani the nut is considered digestive, astringent, diuretic, cardiotonic and emmenagogue, and is used to treat inflammation of the eyes, giddiness and gleet. The young leaves can be eaten as a vegetable or in salads. They are used for treatment of cough and bronchial troubles. The juice of the tender leaves is mixed with oil and used as an application for lumbago. A decoction of the roots is reportedly a cure for sore lips; the roots are also used to treat liver disorders. The bark is used as a deobstruent in treating flatulence, dropsy and choleric affections.



Warning

The chewing of betel-nuts is believed to be an inducing factor for mouth cancer, possibly due to their high tannin content. The unripe fruits are poisonous and believed to be harmful to the eyesight.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

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Caryota urens L.

Common names

Bengali: bankhajur, golsago; ***English***: Indian sago-palm, jaggery-palm, kitul-palm, toddy-palm; ***Gujarati***: shankarjata, shivajata; ***Hindi***: bankhajur, mari; ***Kannada***: bagani, baini; ***Konkani***: birla-madd, birlimad; ***Malayalam***: anapana, chundappana, iram-pana, iram-panei, kala-pana, kondappana; ***Marathi***: berli, berli-mad, bherawa, birli, surmadi wirthi supari; ***Oriya***: modhura, solopa, solopo; ***Sanskrit***: dhoajavriksha, dirgha, mada, meda; ***Tamil***: irambanai, kondalpanai, kondapanei, kon-dapanna, tippili, tippilipanei; ***Telegu***: jilugu, jilugujattu, kondajivalaggu, mari, mhar.

Description

A lofty, handsome palm up to 22 m tall with a smooth, grey, cylindrical trunk, and a crown of 6–10 large leaves. Leaves bipinnate, up to 6 m long and 4 m wide, primary divisions up to 1.8 m long, pinnae borne on 18–25 secondary rachises, each bearing 36 pairs of leaflets and a terminal leaflet; petioles very stout, 30 cm long and 4 cm wide. Spathe boat-shaped, 30–45 cm long, enclosing inflorescence; spadix very long (3–3.6 m), with up to 120 secondary branches on thick, cylindrical primary axils hanging down; flowers numerous, borne in groups of 3, both male and female narrowly cylindrical, light red. Fruit (drupe) 1–2-seeded, 1.7–2 cm in diameter, red when ripe; seeds 1–2 per fruit, with corrugated surfaces, hairy.

Distribution and habitat

Considered to be indigenous to India, Sri Lanka and Myanmar (Burma). It is very common in the moist forests of the Eastern and Western Ghats of peninsular India, especially in Kerala, in cooler valleys of Chota Nagpur, and in Orissa, West Bengal and in the sub-Himalayan hills of north-eastern India to an altitude of about 750 m, occasionally to 2000 m. The tree is cultivated in many parts of India for *sago*, prepared from the starch harvested from the trunk; *toddy* (palm wine) and *jaggery* (palm *gur*), from the sap which is tapped from the spathe; and a versatile fibre is obtained from the leaf sheaths, petioles and floral stalks. It is also planted in gardens throughout the country as an ornamental.

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Medicinal properties and uses

The nuts, or seed kernels, are used as an external application to the head to treat hemicrania. In Ayurveda, they are considered acrid and cooling, and are reportedly used to reduce thirst and fatigue. The freshly drawn sap from the spathe is used as a laxative.

Warning

The fruits contain irritating, needle-like crystals and the pulp or juice is externally irritating and internally very toxic, causing inflammation that can last for several hours.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

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Cocos nucifera L.

Common names

Bengali: dab, narikel; ***English***: coconut palm; ***Gujarati***: naliyer, nariyela; ***Hindi***: nariel, nariyal; ***Kannada***: tengina, thengu; ***Konkani***: madd; ***Malayalam***: narikelam, tenga; ***Marathi***: narel, tenginmar; ***Oriya***: gotoma, nodia, paido, trinodrumo; ***Sanskrit***: narikela; ***Tamil***: tenga, tenkai, thennei; ***Telegu***: kobari, narikadam, narikelamu, tenkai, tenkaya; ***Urdu***: nariyel.

Description

A tall palm, usually 12–24 m tall with a straight or curved stem. Leaves 1.8–4.5 m long, leaflets equidistant, 60–90 cm long, linear-lanceolate, coriaceous; petioles 0.9–1.5 m long. Spadix 1.2–1.8 m long, stout, simply branched; lower spathes 60–90 cm long, oblong, hard, splitting lengthwise; male flowers unsymmetric with small sepals and oblong petals 0.6 cm long, female flowers larger than male, globose, 2.5 cm long. Fruit 20–30 cm long, subglobose to obovoid, 3-angled, green or yellowish, turning brown when ripe, containing a single seed ('coconut').

Distribution and habitat

Believed to have originated in the Pacific islands, the coconut palm has been introduced to coastal regions throughout the tropics, and has become naturalized in many regions beyond its original range. In India, it is cultivated in moist tropical and subtropical regions of the country, particularly near the sea.

Medicinal properties and uses

The roots, flowers, unripe and ripe fruit, and seed oil are all used for a variety of purposes in traditional Indian medicine, including Ayurveda, Unani and Siddha. The roots are used as a diuretic and as an astringent gargle for sore throat; they are also useful for treating uterine diseases. The flowers are sometimes used as an astringent; mixed with oil they are used as an external application for swellings. The freshly drawn sap from the spadix is considered cooling and refrigerant. The water from the unripe fruits is cooling and thirst-quenching, and is used to treat fever and urinary disorders. The sweet white endo-

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carp ('meat') of the seed is considered diuretic and aphrodisiac; it is used extensively in South Indian cooking. The fresh 'milk' from the ripe fruit is used to treat debility, incipient phthisis and cachectic affections. The oil expressed from the dried endocarp (*coconut oil*) is used as a local application for treating alopecia and hair loss following fevers and debilitating diseases; it is a common ingredient of hair oils and is used worldwide to promote skin tanning.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956, 1969), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

Phoenix acaulis Buch.-Ham. ex Roxb.

Common names

English: dwarf date palm; ***Hindi***: jangli khajur, khajur, pind khajur, thakal; ***Marathi***: boichind, shevra, shilind; ***Oriya***: kojiri; ***Sanskrit***: bhukharjuri; ***Telegu***: yita.

Description

A short stemless palm with a thick, ovoid base 15–25 cm in diameter covered with persistent leaf bases. Leaves pinnate, 0.6–1.8 m long; pinnae linear, stiff, 25–50 cm long, base thickened; lowest leaflets reduced to sharp spines. Flowers borne in compressed, branched spadices that are longer than the spathe. Fruit (berry) oblong-ellipsoid, 1.2–1.7 cm long, bright red turning blue-black when ripe, edible; seed oblong, grooved. In central India, flowering occurs mainly in April and May, and fruiting in May and June.

Distribution and habitat

Found in the outer Himalayas, the Khasi and Naga hills of Meghalaya and Nagaland into Myanmar (Burma), in Bihar, Orissa, central India and elsewhere in peninsular India. It is common, sometimes gregarious, in open sal (*Shorea robusta*)-dominated forests of the Satpura hills, and in grassy areas, particularly on clayey soils.

Medicinal properties and uses

The roots and the pith are reportedly used as aperients. The pith of the stem is edible, and yields a type of *sago*; the fruits, tender peduncles and terminal leaf buds are also edible.

References

CSIR (1948–1992), Yoganarasimhan (1996).

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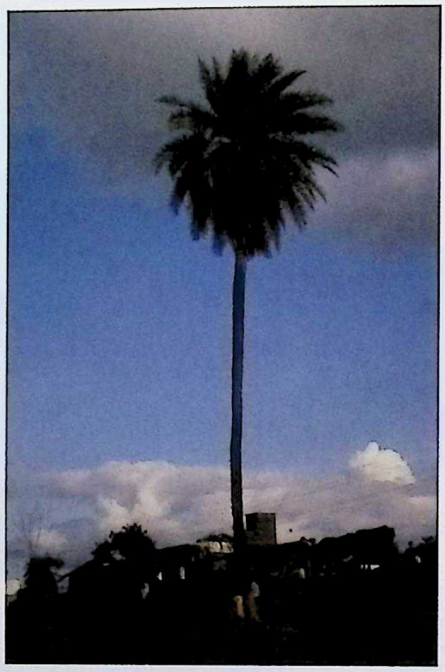
Phoenix sylvestris (L.) Roxb.

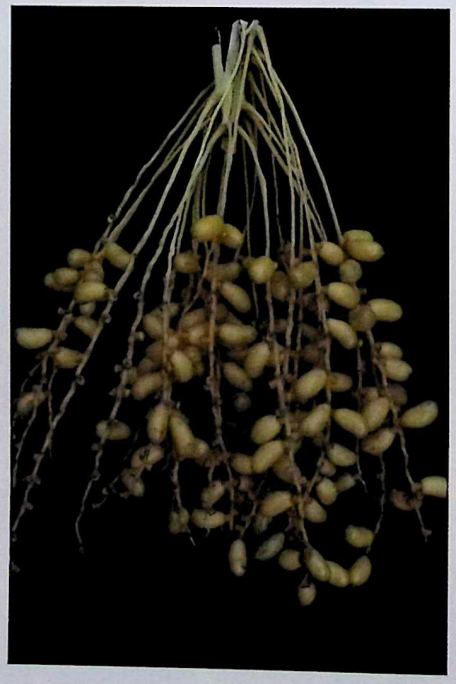


Common names

Bengali: kajar, kejur, khajur; ***English***: date sugar palm, wild date palm; ***Gujarati***: kajuri, khakri, kharak, yadi; ***Hindi***: khajur, salma, sendi, thakil; ***Kannada***: anda-dayichalu, ichal, ichalu; ***Konkani***: kajuri; ***Malayalam***: kattinta; ***Marathi***: boichand, sendri, shindi; ***Oriya***: khajuri, khejuri, kojari; ***Punjabi***: khaji, khajur; ***Sanskrit***: kharjura, kharjuri; ***Tamil***: icham, injai, periyaitcham; ***Telegu***: eetha, pedda-itta, peddayita.

Description

A graceful palm 10–16 m tall with a large crown and rough trunk covered with persistent leaf bases. Leaves 3–4.5 m long, greyish-green, with a few short (to 10 cm) spines at the base; pinnules numerous, linear, 15–45 cm long and 2–2.5 cm wide, ending in short points. Flowers small, fragrant, borne in spadices; male flowers white, female greenish. Fruiting spadix about 90 cm long, bearing oblong-ellipsoid berries, 2.5–3.2 cm long, orange-yellow when ripe; seed approximately 1.7 cm long, deeply grooved with rounded ends. Flowers between March and May in most parts of India; fruits ripen in September and October.



Distribution and habitat

Common in many parts of India and Myanmar (Burma) to an altitude of 1500 m either wild or, more often, under cultivation. It prefers moist, well-drained alluvial soils and is often found in low-lying sites and on streambanks in central India; in southern India it often forms dense thickets.

Medicinal properties and uses

The edible fruits are considered cardiotonic and constipating in Ayurveda, and are used to treat heart and abdominal complaints, fever, vomiting and unconsciousness. They are commonly pounded and mixed with almonds, quince seeds, pistachio nuts, spices and sugar and eaten as a restorative remedy. The seeds, made into a paste with the roots of *Achyranthes aspera* (*Amaranthaceae*), are eaten with betel leaf (*Piper betle*: *Piperaceae*) for treating ague.

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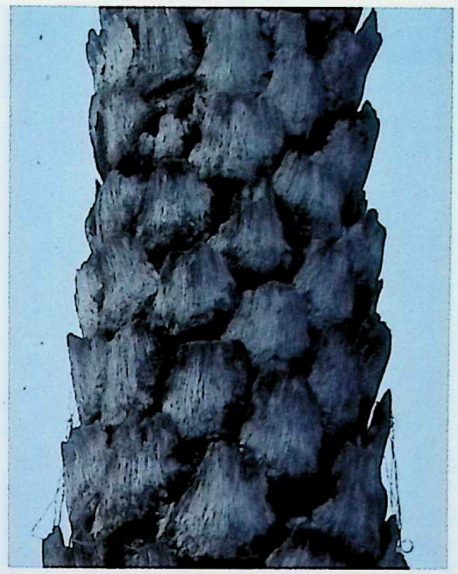
A paste of the roots of the young plant are reportedly given to relieve nausea in southern West Bengal; the roots are also used to relieve toothache. The tender, meristematic portion of the stem is used to treat gonorrhoea and gleet and, among Irular women in Tamilnadu, is eaten to relieve pain during the final month of pregnancy. The upper part of the stem bearing older leaves is tapped in many parts of India between October and February for its sap (*nira*), which is used as a refreshing, sweet, vitamin-rich beverage or converted into *jaggery* (*gur*) and sugar. The ripe fruits are also commonly made into jams and jellies. The leaves are widely used for thatching and for making mats, fans, baskets and other handicrafts.



References

Chopra *et al.* (1956), CSIR (1948–1992), Ghosh and Sensarma (1997), Kirtikar *et al.* (1935), Ragupathy and Mahadevan (1991), Yoganarasimhan (1996).

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Aristolochiaceae

Aristolochia bracteolata Lam.

Botanical synonym

Aristolochia bracteata Retz.

Common names

English: bracteated birthwort; ***Gujarati***: gudhatee, kidamari; ***Hindi***: bhringi, gandan, kiramar; ***Kannada***: adumuttadagida, kaththe kirubana gida, kattackirubanagida, kuri gida, sanajali-hullu; ***Malayalam***: aduthinnapala, atu-tinlap; karalakam; ***Marathi***: gandhani, gaval, kidamar; ***Oriya***: paniri; ***Sanskrit***: dhumapatra, kitamari; ***Tamil***: aduthinnappalai; ***Telegu***: gadaparaku, gagidadapaku, gadide, kadapara.

Description

A slender, prostrate or decumbent, glabrous perennial herb with a thick rootstock, 30–45-cm-long stems and striate branches. Leaves very variable in size and shape: reniform or broadly ovate, usually widely and shallowly cordate at base, margins crenulate, undulate or entire; petioles up to 3 cm long. Flowers solitary, perianth 2.5–5 cm long with a subglobose base, tube cylindrical with trumpet-shaped mouth and linear, dark purple lip, glandular, hairy within. Fruit (capsule) oblong-ellipsoid, 12-ribbed, glabrous; seeds deltoid with cordate base, black on one side and whitish on the other, compressed.

Distribution and habitat

Native to the Old World tropics and subtropics from Africa and Arabia to India, Nepal, Bangladesh and Sri Lanka. Found in northern and central India from Haryana to West Bengal and southwards to Tamilnadu and Kerala. Common in dry areas, particularly on black cotton soils, usually growing as a weed.

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Medicinal properties and uses

The plant is well known in traditional Indian medicine for its bitter, anthelmintic, emmenagogue, alterative and purgative properties. An infusion of the whole, dried plant is used as an emmenagogue and anthelmintic. The dried, powdered root or its decoction is used in Sind to increase contractions during labour. A decoction of the roots is used to expel roundworms. The root juice is used a mouthwash to promote healing of aphthous ulcers among the tribal inhabitants of southern Andhra Pradesh. The bruised leaves, sometimes mixed with castor oil, are applied externally to treat eczema, boils and wounds, and the leaf juice is used to clean infected ulcers. In Rajasthan, the seeds are ground in water and used for softening hair.

Warning

All parts of the plant are nauseatingly bitter. Although used in traditional medicine, the plant may be poisonous to humans and livestock.

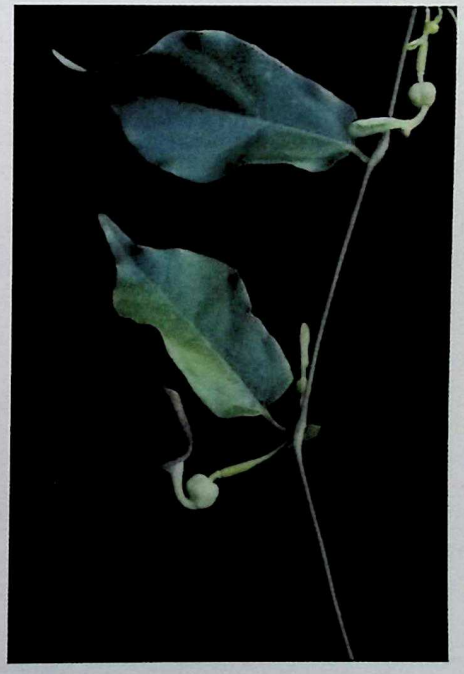
References

Asolkar *et al.* (1992), Bhatt and Mitaliya (1999), Chatterjee and Pakrashi (1991), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935), Nadkarni (1954), Rao *et al.* (1996), Sivarajan and Balachandran (1994), Yoganarasimhan (1996).

Aristolochia indica L.

Botanical synonym

Aristolochia lanceolata Wight



Common names

Bengali: isarmul, isharmul; ***English***: Indian birthwort; ***Gujarati***: arkamul, arkamula, nirvel, ruhimula, sapasan, sapsanda; ***Hindi***: isarmul, isharmul, isharmula; ***Kannada***: gopataputtitoppalu, ishwariballi, ishwariberu; ***Malayalam***: ishwaramulli, isvaramuli, karalakam, karalayam; ***Marathi***: kadula, sampsun, sapashi, sapasan, sapsanda; ***Oriya***: gopakaroni, phoniori; ***Sanskrit***: arkamula, ishwari, isvari, jata, nakuli; ***Tamil***: garudakkodi, ichchuramula, isuramuli, perumarindu, perumkizhangu; ***Telegu***: dulagooda, eswaramuli, govila, isara, ishveraveru, nallaeswari, thella usirika; ***Urdu***: shapesand.

Description

A perennial climber with greenish-white, grooved stems and long, twisted, slightly tuberous roots. Leaves very variable, from linear-oblong to obovate-oblong or subpandurate, 4–12 cm long and 1.3–7.5 cm wide, apex usually obtusely acuminate, entire with somewhat undulate margins, base cuneate, rounded, truncate or subcordate; petioles up to 1.5 cm long. Flowers borne singly or in 2–3-flowered axillary racemes; perianth up to 4 cm long with a glabrous pale green inflated, lobed and trumpet-shaped mouth, lip purplish-brown

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clothed with purple-tinged hairs. Fruit an oblong or globose-oblong capsule 3–5 cm long, 6-valved; seeds deltoid-ovate, acute, flat, winged. Flowers from July to August in central Indian deciduous forests.

Distribution and habitat

Found throughout most of India, Nepal, Bangladesh and Sri Lanka in the plains and low hills, usually growing on hedges and bushes in scrub and dry deciduous forests.

Medicinal properties and uses

The dried roots and occasionally the leaves constitute an important traditional Indian drug, known as *Iswari* in Ayurveda, believed to have the power to destroy the toxic effects of all poisons, especially snake poison; it is also used as a gastric stimulant, bitter tonic and emmenagogue. The roots are used, usually in the form of a tincture, for the treatment of atonic types of dyspepsia, bowel troubles in children, and intermittent fevers. In large doses it acts as a local irritant, producing nausea, griping pains in the bowels, and sometimes vomiting and tenesmus. A decoction of the roots is considered stimulant and febrifuge; in combination with black pepper and ginger, it is used as a carminative for treating diarrhoea and other bowel complaints. The dried, powdered roots are given with honey to treat leucorrhoea. Among the tribal inhabitants of eastern Bihar, the root powder mixed with mustard oil is used as an external application to ease body pain, the ground root is given as an antidote to snake bites, and the mature leaves are chewed to relieve asthma. Among the tribal inhabitants of the Surguja District in eastern Madhya Pradesh, the root pounded with black pepper is taken to treat rheumatism. The leaf juice is used to treat diarrhoea, cholera and intermittent fevers. The seeds are useful for treating inflammations, biliousness and dry cough. The powdered stem bark mixed in water with that of *Azadirachta indica* (*Meliaceae*) and *Cassia fistula* (*Fabaceae-Caesalpinioideae*), is administered orally as an antidote to snake bite by the Gonds of northern Andhra Pradesh.

References

Asolkar *et al.* (1992), Chatterjee and Pakrashi (1991), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Jha and Varma (1996), Kirtikar *et al.* (1935), Kumar and Jain (1998), Nadkarni (1954), Ravisankar and Henry (1992), Sivarajan and Balachandran (1994), Varma (1997), Yoganarasimhan (1996).

Thottea siliquosa (Lam.) Ding Hou

Botanical synonyms

Apama siliquosa Lam., *Bragantia wallichii* R. Br. ex Wight & Arn.

Common names

Kannada: chakranike, mirsagni; ***Malayalam***: alpam, kotaashari, thavasimuruaga; ***Marathi***: chakrani; ***Sanskrit***: chakrani; ***Tamil***: alpom, puthuluvena; ***Telegu***: tellayeshwari.

Description

An erect, slender shrub, 1.8–3 m tall, with smooth yellowish-grey bark. Leaves alternate, 3-ribbed from the base, elliptic-lanceolate or oblong-lanceolate, narrowly acute to acuminate, entire, glabrous above and slightly pubescent beneath, slightly aromatic when bruised. Flowers purplish, borne in irregular, few-flowered axillary cymes; bracts small, linear, acute, pubescent; pedicels rather long, densely pubescent; perianth tripartite, segments broadly ovate or suborbicular, 5 mm long, pubescent, concave. Fruit (capsules) linear, usually 7.5–10 cm long, straight, obtuse, 4-angled; seeds trigonous, pitted, 2.5 cm long. Flowers almost throughout the year in southwestern India.

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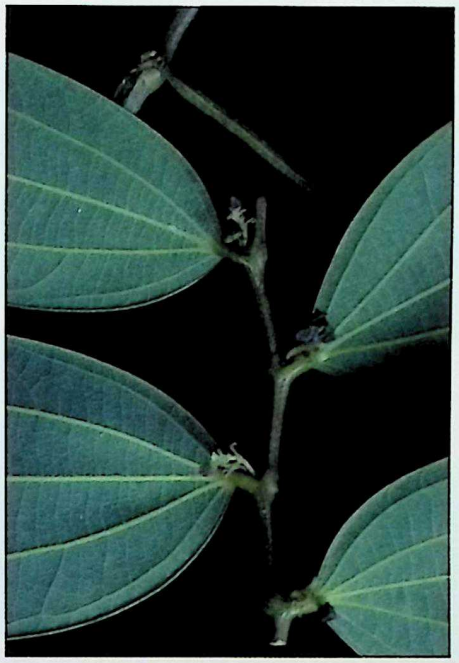

Distribution and habitat

Found in western peninsular India from Konkan (Maharashtra) to Kerala and in Sri Lanka; common in moist, shaded habitats in evergreen to semi-evergreen forests of the Western Ghats.

Medicinal properties and uses

An ointment prepared from the plant is used to promote the healing of chronic sores and ulcers. The mature roots, taken in the form of a paste with lemon, are reputed in traditional Indian medicine as a cure for diarrhoea and dysentery, and are considered useful for treating cholera. The roots and leaves are reportedly used as a sedative for treating snake bites.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Nadkarni (1954), Yoganarasimhan (1996).

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Asclepiadaceae

Asclepias curassavica L.

Common names

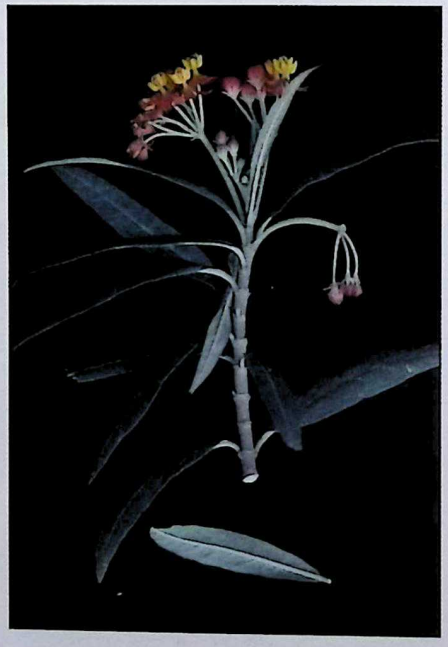
Bengali: bankarpas; ***English***: blood flower, curassavian swallow-wort, silkweed, West Indian ipecacuanha; ***Hindi***: kakatundi; ***Kannada***: kakatundi; ***Marathi***: kurki; ***Punjabi***: kakatundi; ***Sanskrit***: kakatundi, kakatundi.

Description

An erect perennial herb with a somewhat woody base 0.5–1.2 m tall; young stems and inflorescences minutely puberulous. Leaves 7–15 cm long and 1.5–3 cm wide, lanceolate or oblong-lanceolate, acute at the base, acuminate at apex, glabrous; petioles short. Flowers orange-red, in many-flowered, shortly peduncled umbel-like cymes. Fruits (follicles) erect, 6–7.5 cm long and 0.8–1 cm wide, straight, tapering at both ends; seeds 6–6.5 mm long and *c.* 4 mm wide with a thickened margin, coma 2–2.5 cm long. Flowers and fruits from May to August.

Distribution and habitat

Native to tropical America. Introduced as an ornamental plant in India, where it has become naturalized in many parts of the country at lower elevations in waste places and on roadsides.



Medicinal properties and uses

All parts of the plant are used in traditional Indian medicine. The whole plant is considered emetic, styptic, purgative and toxic. It is used in the form of powders, balms and enemas to treat abdominal tumours and tuberculosis. The latex obtained from the plant has bactericidal properties and is used against warts and corns. The juice of the flowers is a good styptic. In the form of a poultice the

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crushed flowers are also used to relieve headache. The juice of the leaves is considered antidysenteric, anthelmintic and sudorific; it is used to relieve haemorrhages and gonorrhoea. The root is astringent, cathartic, emetic, purgative and styptic; it is used as a remedy for piles, warts and gonorrhoea. The root powder, mixed with an equal quantity of powdered *Acorus calamus* (*Araceae*) root, is used to treat chronic ulcers. A decoction of the root is reportedly used against cancer. In Ayurveda, the whole plant is used to treat hair loss, epilepsy, cough, leprosy, mental disorders, and as a tonic and rejuvenator.

References

Asolkar *et al.* (1992), Chatterjee and Pakrashi (1995), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935), Nadkarni (1954), Yoganarasimhan (1996).

Calotropis gigantea (L.) R. Br.

Botanical synonym

Asclepias gigantea L.

Common names

Bengali: akand, akanda, gurakand, swetakand; ***English***: bowstring hemp, gigantic swallow-wort, madar, milkweed; ***Gujarati***: akado; ***Hindi***: ag, ak, akand, akaua, akua, ark, madar, mudar, safed ak; ***Kannada***: arka, lekkedagide, yekkadagida; ***Konkani***: rhui; ***Malayalam***: bukam, dinesam, erikku, erukka, vellerukku, yerikku; ***Marathi***: ak, akand, akra, lal akra, lal madar, mudar, rui; ***Oriya***: akado, akondo, bikhortono, kotuki, uruk; ***Sanskrit***: aditya, arka, arkah, mandara, pratapasa, ravi, rupika; ***Tamil***: arkkam, erukkam, erukku, verukku, yerikan; ***Telegu***: jilledu, mandaramu, nallajilleedu; ***Urdu***: ak.

Description

A much-branched, hardy, erect evergreen shrub or treelet up to 5 m tall. Stems woody with yellowish-white bark, young stems and branches covered with soft, loosely appressed, whitish, waxy or sometimes powdery pubescence. Bark thick, light yellow or ash-grey, soft, corky, deeply fissured. Leaves fleshy, obovate or obovate-oblong, apex acute, rarely rounded, base cordate, 6–20 cm long and 3–8 cm wide, glaucous green, smooth above, cottony below; petioles 0.3–2 cm long. Flowers lilac, pale rose or purple, rarely light greenish-yellow or white, inodorous, with spreading or reflexed corolla lobes, borne in axillary pedunculate corymbs. Fruits (follicles) single or paired, turgid, recurved, 7–10 cm long; seeds numerous, broadly ovate, flattened, brown in colour 2.5–3.2 cm long, including the white tuft of silky hair (coma) at the pointed end. Flowers almost throughout the year but most commonly from November to March in central India; fruits mature mainly between February and August.

Distribution and habitat

Native from Pakistan and Nepal through India to Sri Lanka, the Maldive Islands,

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southern China and Malesia. In India, it is common on a variety of soils almost throughout the country to an altitude of 1000 m, from Punjab and Rajasthan to West Bengal and Assam southwards through peninsular India. It occurs in open habitats such as sandy riverbanks, cultivated fields, roadsides, grazing lands and other disturbed or degraded sites throughout the drier parts of its range.

Medicinal properties and uses

The leaves, roots, flowers and latex are all used in Ayurvedic practice, entering into many compound preparations such as *Kaccoradi oil*, *Dhanvantaram ghritam*, *Vajrakatailam* and *Nagaradi tailam*. The root bark is highly valued and commonly used in traditional Indian medicine. It resembles ipecac (from the roots of *Cephaelis ipecacuanha*: *Rubiaceae*) in its action and is used as a substitute for it in the treatment of a variety of conditions. In small doses it is diaphoretic and expectorant, acts as a mild stimulant, and is given with carminatives to treat dyspepsia. The powdered root bark is used to relieve diarrhoea and dysentery, coughs, asthma and fevers. It is considered an effective remedy for syphilis. A paste prepared from the root bark is used externally for relief in elephantiasis and hydrocele. Among the Kondhs of southwestern Orissa, a paste prepared from the root is applied as a poultice to relieve rheumatic pain. In the Homeopathic system of medicine, it is reported to be useful in the treatment of elephantiasis, lupus and chronic rheumatism. The Bhils of Maharashtra reportedly use the root extract in the form of a pill to kill guinea worms; they also use the latex from the plant as a local application to treat ringworm and other skin diseases. A mixture of the stem bark and black pepper is taken internally by the Paharia and Santhalis of Bihar to treat epilepsy. The flowers possess digestive and tonic properties, and are used in powdered form for treating cough, catarrh and asthma. The dried powdered flowers are taken in small doses with honey to treat mental disorders by the tribal inhabitants of Maharashtra. Among the Baigas of northeastern Madhya Pradesh, the ashes of the burned flowers, mixed with honey, are given orally in the treatment of whooping cough and asthma; they also apply the flowers to stiff joints to relieve pain. The roasted leaves are applied to relieve painful joints or swellings. The dried, powdered leaf is boiled in sweet oil for external use to treat eczema, skin eruptions, toothache, ulcers and wounds; its tincture is used for relief of intermittent fevers. Active principles extracted from the roots, leaves and stalk include calotropin, which is reportedly effective in fertility control.

Warning

In large doses, the root bark causes nausea, vomiting and diarrhoea. Prolonged higher doses cause headache, burning in micturition and leucorrhoea. The latex exuded from the cut stem, roots, branches and leaves is toxic, having a caustic effect on the mucous membranes, and may cause secondary dermatitis. It acts as a drastic purgative and emetic.

References

Asolkar *et al.* (1992), Chatterjee and Pakrashi (1995), Chopra *et al.* (1956), CSIR (1948–1992), Girach (1992), Jain *et al.* (1989), Kirtikar *et al.* (1935), Sivarajan and Balachandran (1994), Upadhye *et al.* (1994), Varma (1997), Verma *et al.* (1995), Yoganarasimhan (1996).

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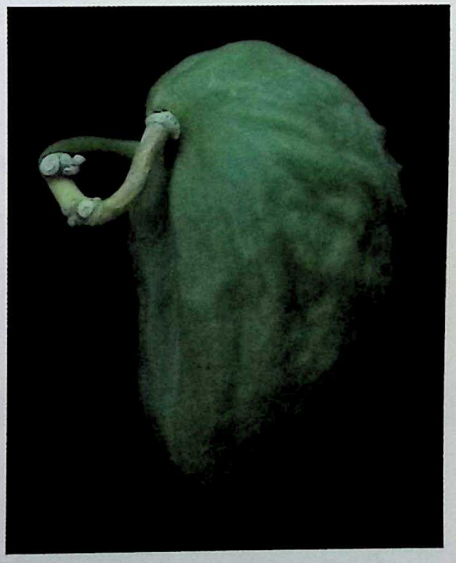
Calotropis procera (Ait.) R. Br.

Botanical synonym

Asclepias procera Ait.

Common names

English: Dead Sea apple, milkweed, sodom apple, swallow-wort; ***Gujarati***: akado, akdo, ankado, nani rui, nano akado; ***Hindi***: ak, akada, akaua, akua, madar, mudar, safed ak; ***Kannada***: bili yekkada gida, yakkigida; ***Marathi***: ak, akra, mandara, mudar, rui; ***Oriya***: orka; ***Punjabi***: ak, madar, shakar-al-lighal; ***Sanskrit***: alarka, arka; ***Tamil***: vellerku, velleruku; ***Telegu***: chinna jilleedu, jelledu, mandaramu, nallajilledu.



Description

A hardy, erect, pubescent evergreen shrub with soft, corky bark, very similar in appearance to *Calotropis gigantea*, but distinguished by its more compact form, somewhat more oblong leaves, and its flowers, which have a strong fragrance. Leaves subsessile, broadly ovate, ovate-oblong, elliptic or obovate, acute or mucronate, slightly cordate and auricled at base, cottony-pubescent when young, glabrous when full-grown, 5–23 cm long and 4–9 cm wide, pale green above, white tawny beneath. Flowers white to pink, spotted or tinged with purple, corolla lobes erect, silvery outside with a strong odour; flowers borne in long-peduncled umbellate cymes that are cottony-pubescent when young. Fruit (follicle) subglobose, ellipsoid or ovoid, recurved, generally 10–14 cm long; seeds numerous, ovoid, acute, narrowly margined, light brown, with a white tuft of silky hair (coma) at the pointed end. Flowers and fruits almost throughout the year; in central Indian deciduous forest regions flowering occurs mainly from December to February and fruiting between February and April.

Distribution and habitat

Native to India, common on a variety of soils almost throughout the country to an altitude of 1000 m, from Punjab and Rajasthan to West Bengal and Assam southwards through peninsular India; conspicuously absent in Kerala. It occurs in open habitats such as cultivated fields, roadsides, grazing lands and other disturbed or degraded sites throughout the drier parts of its range.

Medicinal properties and uses

The parts of the plant used and their medicinal properties are the same as those for *Calotropis gigantea*, described above. The

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root bark of both species is official in the Indian Pharmacopoeia. In southern West Bengal, a paste prepared from the roots mixed with leaves of *Ocimum sanctum* (*Lamiaceae*) is taken to treat menorrhagia. The root bark is reportedly used in the treatment of leprosy among the Rabaris in the Barda Hills of Gujarat. In northeastern Karnataka, the fresh leaves are given as an antidote to snake bite; in this region, the flower buds mixed with black pepper (fruits of *Piper nigrum*: *Piperaceae*) are given to relieve fever accompanied by shivering. Among the tribal inhabitants of Prakasam District in southern Andhra Pradesh, a paste of the dried flowers is given orally to treat gonorrhoea. The flowers, mixed with honey, are reportedly used by the rural inhabitants of Bhavnagar District in Gujarat to treat cold, asthma and cough. In this region the latex is used to prepare a paste with boiled milk and sugar that is taken internally as an antimalarial drug.

References

Asolkar *et al.* (1992), Bhatt *et al.* (1999), Chatterjee and Pakrashi (1995), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Ghosh and Sensarma (1997), Jadeja (1999), Kirtikar *et al.* (1935), Seetharam *et al.* (1999), Sivarajan and Balachandran (1994), Vijaya Kumar and Pullaiah (1998), Yoganarasimhan (1996).

Cryptolepis buchananii Roem. & Schult.

Botanical synonyms

Cryptolepis reticulata (Roxb.) Schum., *Nerium reticulatum* Roxb.

Common names

Hindi: dudhi, kali dudhi, karanta; ***Kannada***: metaguli hambu; ***Malayalam***: kalipalvalli, kattupalvalli; ***Marathi***: kaovel, kawavel; ***Oriya***: gopikonioro, maloti; ***Sanskrit***: krishnasariva; ***Telegu***: adavipalatige, gurugupalatige, rokallipala.

Description

A large evergreen climbing shrub; bark of young shoots purplish-red, peeling off in papery flakes. Leaves opposite, elliptic-oblong, 5–18 cm long and 2.5–8 cm wide,

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base rounded or short-cuneate, narrowed into a short-mucrunate apex, shining above, glaucous-white beneath; secondary nerves numerous, at right angles to midrib uniting in an intramarginal nerve; petioles 0.5–1.2 cm long. Flowers greenish-yellow, 1.2–2 cm in diameter when expanded, borne in axillary cymes shorter than leaves; calyx lobes 5, ovate-lanceolate, acute; corolla lobes 5, oblong-lanceolate, acute. Fruits (follicles) 5–10 cm long, 1.2–1.8 cm wide, green, straight, divaricate, tapering to a blunt point.

Distribution and habitat

Occurs naturally from northern Pakistan, Nepal and Bhutan through peninsular India to Sri Lanka and Myanmar (Burma). Common throughout central and southern India, especially in dry localities, in deciduous forests and in hedges.

Medicinal properties and uses

In Ayurvedic practice, the root is used as a substitute for that of *Sariva* (accepted source: *Hemidesmus indicus*: *Asclepiadaceae*) to treat polyuria, haemorrhage, gout, wounds, leprosy, anaemia and jaundice. It is considered alterative, aphrodisiac, refrigerant, diuretic and tonic. The root, pounded together with that of *Cassia fistula* (*Fabaceae-Caesalpinioideae*), is given as an antinarcotic to revive the nervous system paralysed by alcoholic intoxication among the tribal inhabitants of southern Bihar. Among the Kolams of northern Andhra Pradesh, the filtered extract of the pounded roots is taken internally to relieve stomach pain.

Warning

The leaves are toxic.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956), Girach and Aminuddin (1995), Ravisankar and Henry (1992), Sivarajan and Balachandran (1994), Yoganarasimhan (1996).

Decalepis hamiltonii Wight & Arn.

Common names

Kannada: magali beru, makali beru; ***Sanskrit***: sariba, svetasariva; ***Tamil***: mahali kizhangu.

Description

A climbing shrub with jointed branches and cylindrical, fleshy, aromatic roots. Leaves opposite, orbicular, elliptic-obovate, approximately 5 cm long; main nerves about 6 pairs, arched. Flowers small, whitish-brown, in axillary, peduncled, paniculate cymes; corolla 5-lobed, white-villous within, corona of 10 scales, alternately long and hooded and short triangular flat. Fruit composed of two thick lanceolate short follicular mericarps 6.3 cm long and 1.8 cm in diameter; seeds shortly ovate, ridged, tipped with a white coma.

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Distribution and habitat

Found in peninsular India up to an elevation of 1400 m; common in forest areas of the Western Ghats.

Medicinal properties and uses

The roots, which have a sweet sarsaparilla-like taste, are considered an appetizer and blood-purifier. In Ayurvedic practice, the root is used as a substitute for the plant drug *Sariva* (comprised of the roots of *Hemidesmus indicus*: *Asclepiadaceae*) to treat polyuria, haemorrhage, gout, wounds, leprosy, anaemia and jaundice.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956), CSIR (1948–1992), Sivarajan and Balachandran (1994), Yoganarasimhan (1996).

Gymnema sylvestre (Retz.) R. Br. ex Schult.

Botanical synonym

Periploca sylvestis Retz.

Common names

Bengali: gadalshingi, merasingi, meshasingi; ***English***: Australian cow plant, periploca of the woods; ***Gujarati***: dhuleti, mardashingi; ***Hindi***: chhotadudhilata, gurmar, merasingi; ***Kannada***: kodapatri, madhunaasha, sannagera, sannagerasehambu, uriyamere; ***Konkani***: ranmogra; ***Marathi***: bedakuli, kalikardori, kavali, vakundi; ***Sanskrit***: ajashrangi, ajashringi, meshashrangi, meshashringi; ***Tamil***: adigam, cherukurinja, shirukurinja; ***Telegu***: podapatri, putlapodra; ***Urdu***: kakarsingi, kakrasingi, mendhasingi.

Description

A large, stout, woody climber with densely appressed hairy branchlets, frequently covering the tops of trees. Leaves opposite, elliptic or obovate-acute, thinly coriaceous, sometimes pubescent above, usually 2–6 cm long and 1–3 cm wide, base usually rounded, truncate or shallowly cordate, apex shortly acuminate; petioles 0.4–1.2 cm, densely pubescent. Flowers borne in crowded umbellate cymes; corolla yellow, 4–5 mm across, tube campanulate. Fruits (follicles) slender, cylindrical, lance-

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olate, glabrous, 6.3–7.6 cm long and 0.8 cm wide; seeds narrowly ovoid-oblong, flat with a broad thin wing, pale brown. Flowers from June to August and fruits from January to April in central Indian deciduous forest regions, where it remains leafless for 1–2 months between February and April.

Distribution and habitat

Found in dry forests in the hill regions of Bihar, Orissa and Madhya Pradesh southwards through southern India to an elevation of 650 m. It is also found in Sri Lanka and parts of tropical Africa. In central India it is most commonly found in open forests on soils derived from sandstone. It is occasionally cultivated as a medicinal plant.

Medicinal properties and uses

The plant is considered antiperiodic, diuretic and stomachic. In Ayurvedic practice, the root and leaf are used to treat headache, hydrocele, polyuria, leprosy, pruritis, poisoning, wounds and bronchial asthma. The leaves are believed to be hypoglycaemic and are an important ingredient of Ayurvedic formulations for diabetes; they are also used to treat cough and fever. Among tribal women in some regions of Madhya Pradesh, the leaves, mixed with a small portion of the seed kernel of *Syzygium cumini* (*Myrtaceae*), are reportedly taken with water on an empty stomach to regularize the menstrual cycle. In northeastern Karnataka the leaf paste is used externally to promote the healing of bone fractures. Mixed with castor oil, the leaves are used as an external application to relieve swollen glands and enlarged spleen. The leaf powder stimulates the heart and circulatory system, and increases urine production; it has been used to treat parageusia, furunculosis and as an errhine. The leaves, when chewed, temporarily paralyse one's ability to taste sweet and bitter substances. Among the Gonds of Andhra Pradesh, the filtered extract of the ground leaf twigs is taken orally to relieve malarial fever. The seeds are emetic and are used to treat colds. The root is considered to possess astringent, emetic, expectorant, cooling, stomachic and tonic properties.

References

Asolkar *et al.* (1992), Chatterjee and Pakrashi (1995), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935), Ravisankar and Henry (1992), Seetharam *et al.* (1999), Shah and Singh (1990).

Hemidesmus indicus (L.) R. Br.

Botanical synonym

Periploca indica L.

Common names

Bengali: anantamul, anatomul; ***English***: false sarsaparilla, Indian sarsaparilla; ***Gujarati***: durivel, sariva, upalasari; ***Hindi***: anantamul, anantmul, hindi-salsa, kapuri, magrabu; ***Kannada***: karibandha, sogade, sogade beru; ***Konkani***: dudvali; ***Malayalam***: nannari, naruninti, paravalli; ***Marathi***: anantamul, anantvel, upalasari; ***Oriya***: guapanomulo, mojanoi, onontomulo; ***Punjabi***: anantamul; ***Sanskrit***: ananta, anantamula, gopakanya, gopasuta, gopavalli, gopi, gopimulam, sariba, sariva, sugandhi; ***Tamil***: aritinviyachi, nannari, sariyam, urgadam; ***Telegu***: gadisugandhi, muttavapulagamu, nannani, suganda-pala-sugandhi-pala; ***Urdu***: aushbah, aushba-hemaghrabi.

Description

A slender, twining or prostrate perennial shrub with cylindrical stems, thickened at the nodes, and aromatic roots. Leaves simple, opposite or whorled, short-petioled, variable in shape from broadly ovate to

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oblong-elliptic, linear or linear-lanceolate, obtuse or apiculate, 3–10 cm long and 0.3–3.8 cm wide, base acute, rounded or truncate, apex rounded or emarginate and apiculate, leathery, dark green above, often variegated with white along the veins, paler beneath, leaves on flowering shoots broader and brighter green than other leaves; petioles 0.1–0.6 cm long. Flowers small, greenish-yellow outside and purplish inside, crowded in subsessile axillary cymes shorter than the leaves; calyx deeply 5-lobed, glandular within; corolla 5-partite, 0.6–0.8 cm in diameter when expanded, lobes thick, ovate-oblong. Fruit (follicle) glabrous, often purplish, slender, cylindrical, sometimes curved, 10–12 cm long and 0.5–0.6 cm wide, divaricate, containing numerous black, flattened, ovate-oblong seeds with a silvery-white coma. Flowers mainly between July and October and fruits from October to February within its Indian range.

Distribution and habitat

Common in open deciduous and scrub forests, hedges and on degraded sites from the upper Gangetic plains of northern India eastwards to Assam and southwards through peninsular India to Sri Lanka.

Medicinal properties and uses

The dried roots, known commercially as *Hemidesmus* or *Anantamul*, are official in the Indian Pharmacopoeia. The root and root bark are considered tonic, alterative, demulcent, diaphoretic, diuretic and blood-purifying. They are used in several well-known Ayurvedic preparations for treating bowel complaints, elephantiasis, fever, hemiplegia, nausea, syphilis and vomiting. Administered in powdered form or as an infusion, decoction or syrup, it is prescribed for anorexia, dyspepsia, fever, leucorrhoea, chronic rheumatism, gravel and other urinary diseases, scorpion stings and skin diseases. The root paste is applied to the forehead to reduce fever among the Paharia in southern Bihar. Among the Kondhs of southwestern Orissa, the crushed root is applied externally to relieve itching, and its decoction is used to control excessive menstrual flow, or mixed with mother's milk to check diarrhoea in infants. The powdered root, mixed with the stem bark of *Syzygium cumini* (*Myrtaceae*), is taken by tribal women (Bondo) in southern Orissa soon after childbirth to increase lactation; in northeastern Karnataka the root

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extract is taken with arrack for the same purpose. A hot infusion of the root bark with milk and sugar is given to children to relieve chronic cough and diarrhoea. In southern Orissa, a paste prepared from ground root tuber, mixed with fennel seed (*Foeniculum vulgare*: *Umbelliferae*), is taken with molasses to check diarrhoea and dysentery. In Kerala, the milky latex is used to relieve eye inflammation.

References

Aminuddin and Girach (1991), Asolkar *et al.* (1992), Chatterjee and Pakrashi (1995), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Girach (1992), Kirtikar *et al.* (1935), Mohanty *et al.* (1996), Seetharam *et al.* (1999), Shah and Singh (1990), Sivarajan and Balachandran (1994), Varma (1997), Viswanathan (1997).

Pergularia daemia (Forssk.) Chiov.

Botanical synonyms

Asclepias daemia Forssk., *Cynanchum echinatum* Thunb., *C. extensum* Jacq., *Daemia cordifolia* (Retz.) Schum., *D. extensa* (Jacq.) R. Br., *Gomphrocarpus volubilis* Moon, *Pergularia extensa* (Jacq.) N.E. Br.

Common names

Bengali: chagulbanti, chagulbati; ***Gujarati***: amaradudheli, chamardudheli, nagaladudhi, nagla dudheli; ***Hindi***: dudhi, dudhi bel, jutuk, sagovani, utranajutuka, utran; ***Kannada***: haalu koratige, hala koritige, juttuve balli, kurudigana balli, alavaarana balli, talayarana balli; ***Malayalam***: veliparatti, veliparuti; ***Marathi***: utaranavel, utarni; ***Oriya***: juktiruhi, uttururi, uturdi; ***Punjabi***: karial, silai, trotu; ***Sanskrit***: kurutakah, uttaramarani, yugaphala, yugmaphala; ***Tamil***: beliparti, nandamani, utthamani, veliparutti; ***Telegu***: dushtupa tige, gurtichettu, guruti, jittupaku.

Description

A slender, hispid, fetid-smelling perennial climber. Leaves opposite, membranous, 3–9 cm long and about as wide, broadly ovate, orbicular or deeply cordate, acute or short-acuminate at apex, pubescent beneath; petioles 2–9 cm long. Flowers greenish-yellow or dull white tinged with purple, borne in axillary, long-peduncled, drooping clusters. Fruits (follicles) lanceolate, long-pointed, about 5 cm long, covered with soft spines; seeds pubescent, broadly ovate. Flowering may occur many times each year between August and January in central India, with fruits maturing from October to February. In central Indian deciduous forests, the stems typically die down in February and reappear with the onset of the rainy season.

Distribution and habitat

Widely distributed in the Old World tropics and subtropics from southern and tropical Africa through Arabia to Afghanistan,

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tropical India and Sri Lanka. In India it is very commonly found in hedges throughout most of the country to an altitude of about 1000 m in the Himalayas and 900 m in southern India.

Medicinal properties and uses

The whole plant is credited with emetic, expectorant and anthelmintic properties. The plant extract has a stimulatory action on uterine and other involuntary muscles and is used to treat uterine and menstrual troubles and to facilitate childbirth. The fresh, pulped leaves are applied as a poultice to relieve carbuncles. A decoction of the leaves is given to children to relieve asthma. The leaf juice is an expectorant in catarrhal affections and is emetic; it is used to treat infantile diarrhoea; mixed with lime or ginger, it is applied externally to relieve rheumatic swellings. Among the tribal and other rural inhabitants of Bhavnagar District in Gujarat, the leaf juice is used for treating asthma, piles and boils. The leaf juice is also used in the preparation of a purgative medicinal oil given for treatment of rheumatism, amenorrhoea and dysmenorrhoea. The root bark, mixed with cow's milk, is used as a purgative.

References

Bhatt and Mitaliya (1999), Bhatt *et al.* (1999), Chatterjee and Pakrashi (1995), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Sivarajan and Balachandran (1994), Yoganarasimhan (1996).

Sarcostemma acidum (Roxb.) Voigt

Botanical synonyms

Asclepias acida Roxb., *Sarcostemma brevistigma* Wight & Arn.

Common names

Bengali: soma, somlata; ***English***: moon creeper; ***Gujarati***: somvel; ***Hindi***: soma, somlata; ***Kannada***: hambu kalli, somalata, soma lathe, vasukani; ***Malayalam***: somam, somavalli, vayastha; ***Marathi***: ransher, somvel; ***Oriya***: borohwi, notasiju, somolata; ***Sanskrit***: soma, somavalli, soumya; ***Tamil***: kodikkalli, kondapala, somam; ***Telegu***: jigatsumoodoo, kondapala, palmakashtamu, somalata.

Description

A usually leafless jointed shrub up to about 1 m tall, with green straggling branches. Flowers white or pale greenish-white, fragrant, borne in terminal umbels. Fruits (follicles) thinly coriaceous, straight, tapering at both ends, 10–12 cm long, containing flat, ovate seeds with an attached 2-cm-long coma. Flowers and fruits usually between May and November, depending on locality.

Distribution and habitat

Typically found in dry, rocky habitats from Bihar and West Bengal to Maharashtra and

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southwards to Tamilnadu and Kerala to 900 m elevation.

Medicinal properties and uses

The whole plant is considered bitter and alterative. A dilute extract of the whole plant is used internally to relieve rheumatic pains by the tribal inhabitants of western Maharashtra. An aqueous extract of the stem is given orally for the treatment of bone fractures among the Gonds of Uttar Pradesh; in northeastern Madhya Pradesh, the plant paste is applied externally for the same purpose. The dried stem is used as an emetic. An infusion of the roots is reportedly given to persons bitten by rabid dogs. The plant is claimed to be one of the sources of *Soma*, mentioned in the Vedas, although the source of this drug is believed to be *Ephedra gerardiana* (*Gnetaceae*). The stem of *Sarcostemma acidum* is sometimes used as a substitute for *E. gerardiana* in Ayurvedic practice in the treatment of dyspnoea, cardiac diseases, fever, cold, oedema, mental disorders and as a rejuvenator.

Warning

This is a very strong drug and should be used only under professional supervision.

References

Chatterjee and Pakrashi (1995), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Kumar and Jain (1998), Singh and Prakash (1994), Upadhye *et al.* (1994), Yoganarasimhan (1996).

Secamone emetica (Retz.) R. Br. ex Schultes

Botanical synonym

Periploca emetica Retz.

Common names

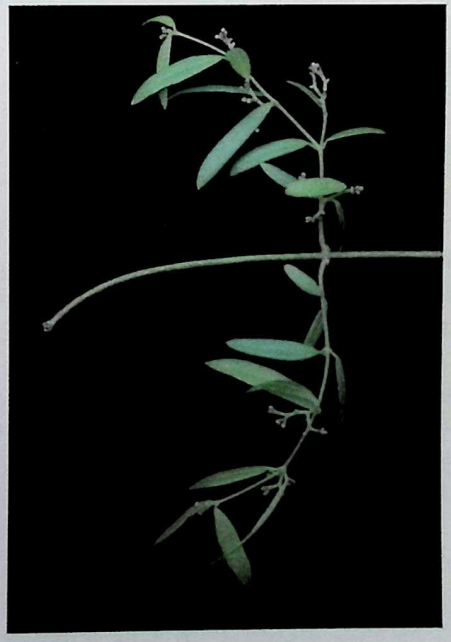
Bengali: shadaburi; ***Kannada***: siranige hambu; ***Tamil***: sangaravalli, kondam, kurinja, sagadam, sarachiru.

Description

A slender, much-branched woody climber; bark brown, thick, corky and deeply cleft. Leaves lanceolate or linear-lanceolate, 3–7 cm long and 0.6–1.8 cm wide, base acute, tapering to a very acute apex; petioles 0.1–0.5 cm long. Flowers yellowish, borne on slender, pubescent pedicels in lax dichotomous cymes; bracts small, pubescent; calyx pubescent; corolla less than 6 mm in diameter, lobes oblong-ovate, obtuse. Fruits (follicles) smooth, slender, straight, acuminate, 7–7.3 cm long.

Distribution and habitat

Native to southern India, Sri Lanka and possibly to tropical East Africa, it is commonly found in forested hills of the Deccan and Carnatic regions of southern India up to about 1200 m.



Medicinal properties and uses

The acrid root is said to possess emetic properties. In Siddha, the root and leaf are used to treat leucorrhoea, fever, dysentery, headache, and as an aphrodisiac and emetic.

References

Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

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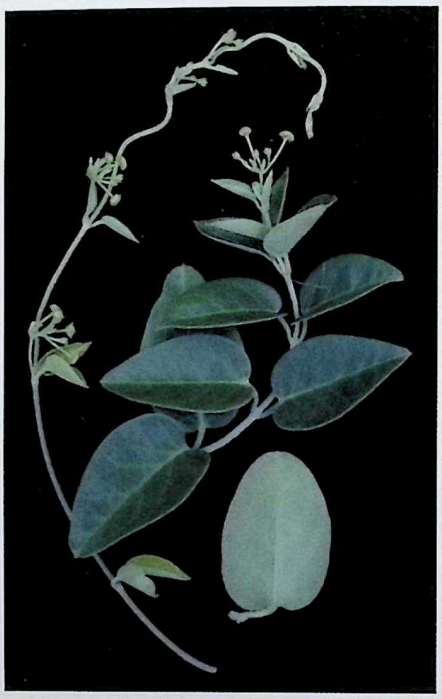
Tylophora indica (Burm. f.) Merr.



Botanical synonyms

Asclepias asthmatica L. f., *Cynanchum bracteatum* Thunb., *C. indicum* Burm. f., *Hoya hirsuta* Moon, *Tylophora asthmatica* (L. f.) Wight & Arn.

Common names

Bengali: ananthamul, antamul; ***English***: emetic swallow-wort, Indian ipecacuanha; ***Gujarati***: damni vel; ***Hindi***: antamul, jangli-pikvam; ***Kannada***: adumuttada, kirumanjiballi, nepala, nepaladaberu; ***Malayalam***: vallippala; ***Marathi***: khodiki raasna, pitkari; ***Oriya***: mendi, mulini; ***Sanskrit***: antrapachaka, arkaparni, gandhana, lataksiri, moolinee, shwasaghni; ***Tamil***: kondachani, mirkkurinja, nach-churuppam, nanja-murich-chaan, nayppalai, peyppalai; ***Telegu***: kaakapaala, kaka palla, kukkapaala, neelataapiri, tellavedavela, tellayadala, verripala, vettipala.

Description

A branching climber or shrub up to 1.5 m tall with a short, knotty rootstock and numerous fine, brittle, fibrous roots possessing a pleasant aromatic odour. Leaves ovate-oblong to elliptic-oblong, base rounded or subcordate, apex acute or obtuse but apiculate, 3–10 cm long and 1.5–7 cm wide, thick, glabrous and dark green above, pale green, often pubescent beneath; petioles 0.5–2 cm long. Flowers greenish-yellow outside, purplish within, borne in many-flowered lateral umbel-like cymes. Fruits (follicles) fusiform, divaricate, striate, 10 cm long and 5 cm wide, attenuate towards the tip into a fine point; seeds broadly ovate, elongated with a 2–2.5-cm-long coma.

Distribution and habitat

Native to the Indo-Malaysian region from the Seychelles through India and Sri Lanka to Southeast Asia, including Malesia. In India, it is found in Assam, West Bengal, Orissa southwards to an altitude of about 900 m in southern India. Particularly common in fields, hedges and open secondary forests on sandy soils at low elevations in southern India. Flowers and fruits in peninsular India from July to October.

Medicinal properties and uses

The sweetish- to acrid-tasting roots are used as an expectorant in chronic bronchitis and the early stages of whooping cough, and are considered useful as a stimulant, for reducing lochia, and for relieving pain due to gout when applied locally. They are considered to be highly effective as an alterative and antirheumatic. The powdered roots are used for treating intermittent malarial fever. The root paste is used as an external application to the eyelids for treating jaundice in northeastern Karnataka. The leaves are considered diaphoretic, emetic and expectorant; in powdered form they are used for treating diarrhoea and dysentery. A decoction of leaves or roots is useful for treating bronchial asthma, bronchitis, diarrhoea and dysentery. Both the leaves and roots are

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used in India as a substitute for ipecacuanha (obtained from the roots of *Cephaelis ipecacuanha*, a plant native to Brazil).

Warning

Alkaloids contained in all parts of the plant may cause dermatitis. In large doses the dried leaves may cause fatal poisoning.

References

Chatterjee and Pakrashi (1995), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935), Seetharam *et al.* (1999), Yoganarasimhan (1996).

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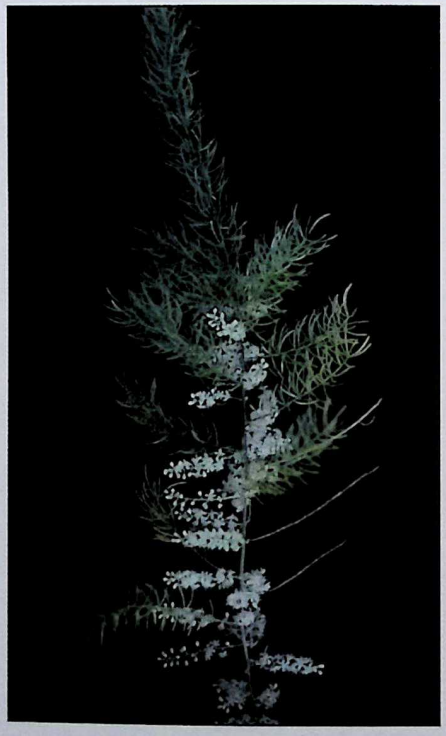
Asparagaceae

Asparagus racemosus Willd.

Common names

Bengali: satamuli, shatamuli; ***Gujarati***: ekalkanto, satavari; ***Hindi***: chatwal, satawar, satmuli, shakakul; ***Kannada***: aheruballi, ashadhi, halavumakkala thayi gida, majjigegadde, sipariberuballi; ***Malayalam***: chatavali, satavari; ***Marathi***: asval, shatavari, shatmuli; ***Oriya***: chhotaru, mohajolo, satabari, satemuli, sibojata, sotabori; ***Punjabi***: bozidan, satawar; ***Sanskrit***: satamuli, satavari, svadurasa, svetmuli; ***Tamil***: ammai-kodi, inli-chedi, kadumulla, nili-chedi, shimai shadavari; ***Telegu***: challagadda, pilli-gaddalu, toala-gaddalu; ***Urdu***: satavara.



Description

A tall climbing, much-branched, spiny shrub with annual woody, whitish-grey or brown stems armed with strong, straight or recurved spines 0.5–1.3 cm long; rootstock short, tuberous, bearing numerous fusiform, succulent tuberous roots 30–100 cm long and 1–2 cm thick. Cladodes (green branchlets) 1.3–2.5 cm long, borne in tufts of 2–6, curved, apex finely acuminate; leaves reduced to sub-erect or sub-recurved spines. Flowers white, fragrant, small, crowded in simple and branched racemes 5–15 cm long. Fruits (berries) globose, red when ripe, 3-lobed, 0.4–0.6 cm in diameter. Flowers between September and November and fruits from October to December in central Indian deciduous forest regions.

Distribution and habitat

Found throughout tropical and subtropical India up to an altitutde of 1500 m in the Himalayas; very common in the upper Gangetic plains and the Bihar plateau. Also found in Sri Lanka, Indonesia, Australia and tropical Africa.

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Medicinal properties and uses

In Ayurveda, the roots are considered alterative, stomachic, tonic, aphrodisiac, galactagogue and astringent to the bowels; they are used to treat dysentery, tumours, inflammations, biliousness, diseases of the blood and eyes, rheumatism and diseases of the nervous system. In Unani the roots are used in the treatment of kidney and liver disorders, gleet and gonorrhoea. They are taken to relieve fever by the tribal inhabitants of southern Bihar. The dried, powdered roots are used by rural inhabitants in Bhavnagar District in Gujarat to increase lactation in nursing mothers and to treat leucorrhoea, sexual weakness and rheumatism. The fresh root juice, mixed with honey, is given to relieve dyspepsia; among the Gonds of Uttar Pradesh and other tribal groups in south-central Andhra Pradesh, it is taken to treat menorrhagia. An aqueous extract of the crushed roots along with those of *Smilax ovalifolia* (*Smilacaceae*) and *Aerva lanata* (*Amaranthaceae*) is used in the treatment of leucorrhoea among the tribal inhabitants of Orissa. A paste prepared from the root along with the leaves of *Ziziphus* spp. (*Rhamnaceae*) is applied to the forehead at bedtime as a treatment for insanity among the Kondhs of southwestern Orissa. Among the Paudi Bhuinya of northern Orissa, a paste prepared from the root mixed with black pepper is applied externally to treat hydrocele. The leaf paste is used in combination with warm water baths to relieve scabies among the Kadars of the Anamalai Hills of Tamilnadu.

References

Aminuddin and Girach (1996), Asolkar *et al.* (1992), Bhatt and Mitaliya (1999), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Girach (1992), Girach and Aminuddin (1995), Kirtikar *et al.* (1935), Rajendran and Henry (1994), Sahoo and Mudgal (1995), Singh and Prakash (1994), Sivarajan and Balachandran (1994), Vijaya Kumar and Pullaiah (1998), Yoganarasimhan (1996).

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Asteraceae

Acanthospermum hispidum DC.

Botanical synonym

Acanthospermum humile auct. non DC.

Common names

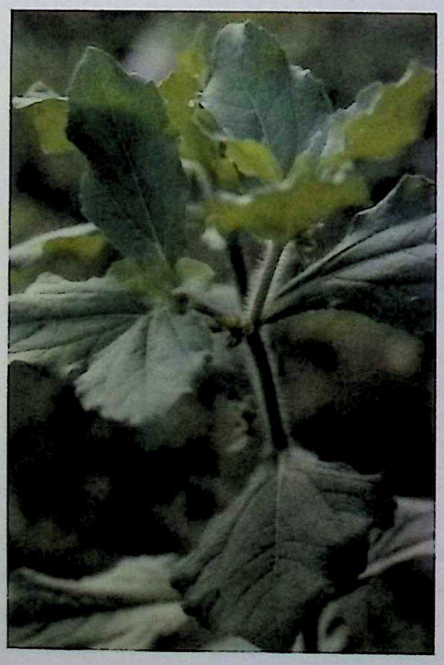
Kannada: kadlemullu.

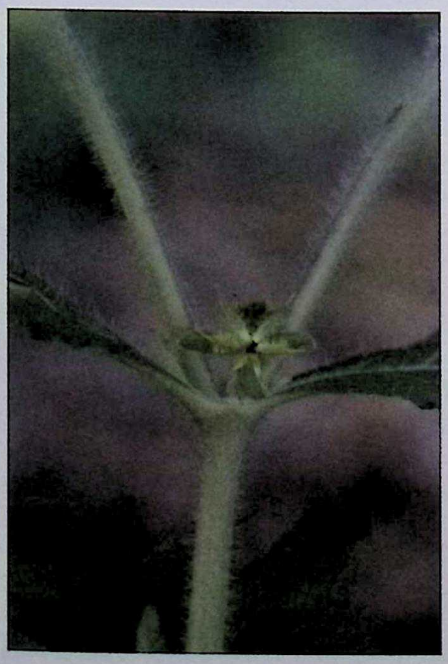
Description

A branched herb up to 60 cm tall; stems covered with spreading, hirsute hairs and smaller glandular hairs. Leaves elliptic, oblanceolate or obovate, 1.5–7 cm long and 0.7–2 cm wide, acute or obtuse at apex, attenuate and subpetiolate at base, margins shallowly serrate, whitish pilose on both surfaces. Flowers yellow, borne in heads in the forks of dichotomous branches. Fruits (achenes) 5–10, triangular, spiny. Flowers and fruits throughout the year.

Distribution and habitat

Native to tropical South America; introduced into tropical and southern Africa, India, Nepal and the Hawaiian Islands. In





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India it is found as a weed along roads and in moist, disturbed habitats throughout most of the country.

Medicinal properties and uses

The crushed herb is used in the form of a paste to treat skin ailments; an essential oil extracted from the leaves possesses antibacterial and antifungal properties. The leaf juice is reportedly used to relieve fevers.

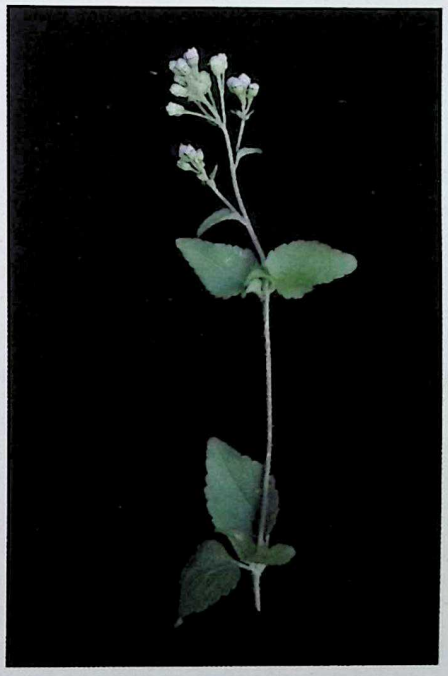
References

Asolkar *et al.* (1992), CSIR (1948–1992), Yoganarasimhan (1996).

Ageratum conyzoides L.

Common names

Bengali: dochunty, uchunti; ***English***: goat weed, white weed; ***Gujarati***: ajaghanda, dholi sadodee, gandhari sedardi, mankdamari; ***Hindi***: koobhi; ***Kannada***: oorala gida, uralgidda; ***Konkani***: sahadevi; ***Malayalam***: appa, muryampacha; ***Marathi***: ghaneraosadi; ***Oriya***: boksunga, pokasunga; ***Sanskrit***: visamustih; ***Tamil***: pumpillu, sinnapumpillu.



Description

A polymorphic, aromatic, annual herb up to 1 m tall, with decumbent stems, rooting at the base; young parts hairy. Leaves opposite or the upper alternate, broadly ovate or rhomboid-ovate to triangular, 2–10 cm long and 1.5–5 cm wide, apex subacute, margins crenate, ciliate, base cuneate, more or less hairy on both surfaces; petioles 2.5–3.2 cm long, hairy. Flowers white, pale blue or violet with a disagreeable odour, in 50–80-flowered heads. Fruit (achene) black, glabrous or thinly hairy, 2–2.5 mm long with awn-tipped, serrate pappus-scales. Flowering occurs throughout the year.

Distribution and habitat

Native to tropical America and naturalized as a weed throughout the tropics. In India it is found throughout most of the country, commonly along roadsides, in open, damp habitats and as a forest understorey species to an altitude of 1800 m; it is often a troublesome weed in tea, coffee and other plantations in southern India.

Medicinal properties and uses

The leaves are considered useful as a styptic. They are applied externally to promote healing of cuts and sores, to treat ague, and are taken internally as a stimulant tonic. The leaves are used with salt as a vulnerary, and are said to prevent tetanus. Boiled with oil, it is applied externally to treat rheumatism. A decoction or infusion of the herb is given to relieve stomach ailments such as diarrhoea, dysentery and intestinal colic with flatulence, and for rheumatism and fever. The powdered leaves are taken orally to treat leucorrhoea among the tribal inhabitants of Udaipur District in Rajasthan. The pounded root is taken daily for a week after menstruation to treat dysmenorrhoea among tribal women in central Orissa. The

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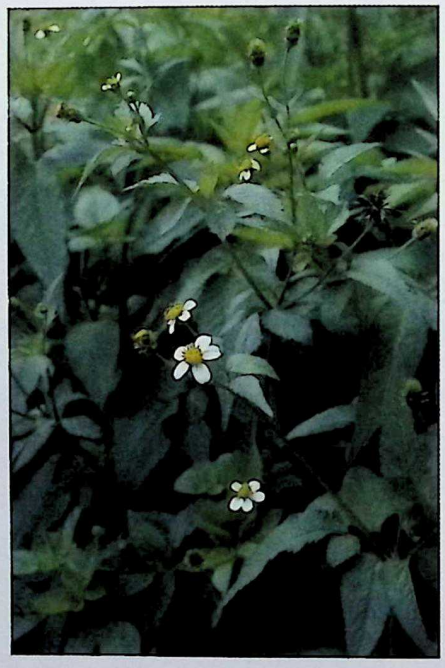
juice of the roots is considered antilithic. The flower buds are thought to be useful to reduce cancerous growths. An essential oil derived from the twigs is effective as an anthelmintic against tapeworms.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956), CSIR (1948–1992), Katewa and Arora (1997), Kirtikar *et al.* (1935), Kumar and Jain (1998), Sahoo and Mudgal (1995).

Bidens pilosa L.



Common names

English: Spanish needle; ***Gujarati***: phutium, samara-kokadi.

Description

An erect, simple or much-branched annual or perennial herb, glabrous or more or less pubescent, 60–90 cm tall; stems quadrangular, grooved; branches opposite. Leaves very variable, sometimes trifoliate, but usually consisting of 2 subopposite pairs of leaflets and a larger, deeply 3-lobed terminal leaflet; petioles 1.5–4 cm long; lateral leaflets ovate, 4–9 cm long and 1.5–3.5 cm wide, abruptly attenuate into a short petiolule 0.5–1 cm long, acute or shortly acuminate at apex; terminal leaflets ovate-lanceolate, 6.5–12 cm long, attenuate at the base to a longer petiolule, 1.5–2.5 cm long, gradually acuminate at apex, leaflets glabrous on both surfaces. Flower heads (capitula) usually numerous, 1–1.5 cm across, elongating in fruit, borne in loose dichotomously branched panicles; ray flowers ligulate, white or yellow, ligules narrow, strap-shaped; pappus of 2–4 rigid, hispid, slightly spreading awns. Fruits (achenes) 0.8–1.7 cm long, linear, quadrangular, slightly tapering towards the apex, black, glabrous, bearing a few pale stiff hairs on the angles in the upper part; pappus bristles 2–4, straw-coloured, 2–3 mm long.

Distribution and habitat

Pantropical in distribution; common throughout India to an altitude of 2000 m, very often as a weed.

Medicinal properties and uses

The warmed juice of the fresh plant is used to treat earache and conjunctivitis, and as a

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styptic on wounds. The roots and seeds are reportedly used as an emmenagogue, expectorant, stimulant and antispasmodic, and for the treatment of asthma. The fresh plant is sometimes used as a pot-herb and is rich in vitamin C.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

Caesulia axillaris Roxb.

Common names

Hindi: bangra; ***Marathi***: maka; ***Sanskrit***: sarvabajin; ***Telegu***: guttikuncha.

Description

A glabrous, erect or decumbent herb, 15–45 cm tall. Leaves 5–15 cm long, lanceolate-oblong or narrowly lanceolate, semi-amplexicaul. Flowers pale blue, lilac or white in globose, compound heads. Fruits (achenes) obovoid, dark brown, ribbed, flattened.

Distribution and habitat

Distributed throughout India to an altitude of 2400 m in marshy habitats; very common in paddy fields.

Medicinal properties and uses

The herb is crushed and applied to wounds to promote healing. The juice extracted from the crushed whole plant is given orally with yoghurt to treat amoebic dysentery, indigestion and loss of appetite among the Baigas of northeastern Madhya Pradesh. The fresh young herb is cooked with rice and eaten by the tribal inhabitants of Andhra Pradesh and Orissa.

References

Asolkar *et al.* (1992), CSIR (1948–1992), Verma *et al.* (1995).

Centratherum anthelminticum (L.) Kuntze

Botanical synonyms

Conyza anthelmintica Roxb., *Vernonia anthelmintica* (L.) Willd.

Common names

Bengali: bapchie, bukshie, hakuch, kaliziri, somraj; ***English***: purple fleabane; ***Gujarati***: kadvojiri, kalijiri; ***Hindi***: bakshi, kalijhiri, kaliziri, somraj, vapchi; ***Kannada***: kadujirige, kalajirige, sahadevi; ***Malayalam***: kalajirakam, kattujirakam, puvankuruntala; ***Marathi***: kalijiri, ranachajire; ***Oriya***: somraj; ***Punjabi***: bukoki, kakshama, kalazira, malwabakshi; ***Sanskrit***: somaraji, somraji, vakuci, vakuchi,

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vakushi; ***Tamil***: kattuchiragam, neychitti, nirnochi, sittilai; ***Telegu***: adavijilakatta, garitikamma, nelavavili, vishakantakamulu; ***Urdu***: janglijiri.

Description

An erect, pubescent, annual herb up to 90 cm tall. Leaves elliptic-lanceolate, 5–9 cm long and 2.5–3.2 cm wide, apex acute, base tapering into the petiole, margins coarsely serrate, pubescent on both surfaces. Florets violet or purple, in many-flowered, homogamous, solitary, axillary or terminal heads 1.3–2 cm in diameter, with a linear bract near the top of the peduncle; involucral bracts linear, hairy. Achenes 4.5–6 mm long, oblong-cylindrical, 10-ribbed, pubescent.

Distribution and habitat

Occurs naturally throughout India on disturbed sites such as roadsides, to an altitude of 1700 m; also found in Sri Lanka and Afghanistan. Sometimes cultivated.

Medicinal properties and uses

The seeds are considered strongly anthelmintic and are used in many areas as a febrifuge and for treating skin diseases and leucoderma in Ayurvedic practice. The seeds are also credited with tonic, stomachic and diuretic properties. In Unani medicine they are used to treat asthma and kidney troubles and in external applications to treat inflammatory swellings. In combination with other plant drugs, the seeds are used for treating snake bites and scorpion sting. On the Malabar coast, an infusion of the seeds is given to treat coughs and flatulence. In Siddha the leaf and seed are reportedly used for treating leucoderma, abdominal and urinary disorders, skin diseases, eczema and mental disorders.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

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Cyathocline purpurea (D. Don) O. Kuntze

Botanical synonyms

Cyathocline lyrata Cass., *Tanacetum purpureum* D. Don

Common names

None reported.

Description

An erect, strongly aromatic, glandular-hairy annual or biennial herb; stems usually reddish- or purplish-tinged, branched from the base, glandular-pubescent. Leaves sessile, variable in size and shape, 1- to 2-pinnatipartite, 5–15 cm long, upper leaves smaller, segments serrate-dentate to lobed, glabrescent or thinly hairy. Flowers variable in colour, borne in terminal corymbose panicles composed of heads 4–5 mm across on 2–5 mm long peduncles; involucral bracts pilose, linear-lanceolate, acute, 2–2.5 mm long; corolla composed of marginal filiform flowers 1.2–1.4 mm long and disc flowers 2 mm long with glandular-hairy lobes. Achenes 0.3 mm long, pappus absent.

Distribution and habitat

Commonly found in moist habitats such as along watercourses and in rice fields throughout most of peninsular and northern India to an elevation of about 1300 m in the western and central Himalayas.

Medicinal properties and uses

The roots are reportedly used to relieve stomach pains. An essential oil extracted from the plant reportedly possesses antimicrobial, anthelmintic and hypotensive properties.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956).

Echinops echinatus Roxb.

Common names

Gujarati: shuliyo, utkanto; ***Hindi***: gokru, utakanta; ***Kannada***: brahma dande; ***Marathi***: kadechubak, utanti, utkatara; ***Sanskrit***: kantaphala, tikshnagra, tiksnagra; ***Urdu***: untkatara.

Description

A rigid, pubescent, annual herb up to 1 m tall, with branches widely spreading from the base. Leaves alternate, sessile, 7.5–12.5 cm long, oblong, pinnatifid, covered with cottony wool beneath, the lobes triangular and oblong, sinuate and spiny, the spines often 2.5 cm long. Flower heads white or purple, compact, globose, 2.5–3.8 cm in diameter (excluding the spines), clustered at the ends of branches; involucres surrounded by strong white bristles resembling pappus-hairs; pappus short, yellowish, forming a short cylindrical brush above the achene. Achenes 4 mm long, densely villous.

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Distribution and habitat

Pantropical in distribution, and found almost throughout India to an elevation of 1500 m. It is common in fields, grasslands, open forests and roadsides in peninsular India.

Medicinal properties and uses

The plant is considered bitter, tonic and diuretic, and is used to treat hoarse cough, hysteria, dyspepsia, scrofula and ophthalmia. In Ayurveda it is used to treat strangury, biliousness, urinary discharges, gleet and heart disease. In Unani the plant is considered stomachic, antipyretic and analgesic; it is used to increase appetite, stimulate liver function and to treat diseases of the brain, ophthalmia, chronic fever, joint pains and inflammation. The roots are considered aphrodisiac in both Unani and Ayurvedic medicine. The powdered roots are applied to the hair to destroy lice. Among the Bhils in Rajasthan, the root extract in water is given orally to treat coughs and colds. A paste of the roots is applied to relieve scorpion sting among the rural inhabitants of Bhavnagar District in Gujarat. The pounded roots, mixed with water, are taken orally for relief of diarrhoea and dysentery by the Kolams of northern Andhra Pradesh. In Ayurveda the root is reportedly used to facilitate childbirth.

References

Asolkar *et al.* (1992), Bhatt and Mitaliya (1999), Bhatt *et al.* (1999), Brahmam and Saxena (1990), Chopra *et al.* (1956), CSIR (1948–1992), Joshi (1989), Ravisankar and Henry (1992), Yoganarasimhan (1996).

Eclipta prostrata (L.) L.

Botanical synonyms

Cotula alba L., *Eclipta alba* (L.) Hassk., *E. erecta* L., *Verbesina alba* L., *V. pseudoacmella* L.

Common names

Bengali: keshori, keshukti, kesuti; ***Gujarati***: bhangra, dodhak, kalobhangro, kaluganthi; ***Hindi***: babri, bhangra, mochkand; ***Kannada***: garagadasoppu, garugalu, kadigargu, kadiggagaraga; ***Malayalam***: kyonni; ***Marathi***: bangra, bhringuraja, maka; ***Oriya***: kesarda; ***Sanskrit***: bhringaraja, bhrngaraja, markava; ***Tamil***: garuga, kaikeshi, kaivishiilai, karishalanganni, kayanthakara; ***Telegu***: galagara, guntagalijeru, guntakalaagara; ***Urdu***: bhangra.

Description

An erect or prostrate, much-branched, hairy herb, often rooting at the nodes. Leaves opposite, sessile, oblong-lanceolate, up to 10.5 cm long and 2.5 cm wide, apex acute, margins serrulate. Flowers small, white, in solitary (or paired) axillary peduncled rayed heads 0.6–0.8 cm in diameter; involucre campanulate; ray florets pistillate, disc florets bisexual; pappus

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of two minute, connate scales; corolla of pistillate flowers ligulate, bifid, those of bisexual flowers tubular with 4–5 lobes. Achenes of ray florets triquetrous, warted, those of disc florets compressed.

Distribution and habitat

A cosmopolitan weed, commonly found throughout India in wet or moist cultivated fields and other open, disturbed habitats such as roadsides and wastelands to 1800 m.

Medicinal properties and uses

One of the ten herbs constituting the group known as *Dasapushpam* ('ten flowers') in Ayurveda, it is considered useful for expelling intestinal worms, curing cough and asthma, and for treating night blindness, eye diseases, headache and diseases pertaining to the hair and its growth. It is widely used in traditional Indian medicine as a tonic and deobstruent to treat hepatic and spleen ailments and in various chronic skin diseases. The fresh plant is considered anodyne; it is rubbed on the gums to relieve toothache and applied with a little oil to relieve headache. It is also applied with sesame oil to treat elephantiasis. The plant juice is administered with aromatics to treat jaundice and fevers; mixed with honey, it is a popular remedy for catarrh in infants. In northeastern Karnataka the whole plant extract is applied to promote the healing of cuts and wounds, and it is also used to treat earache in children. The root is emetic and purgative. It is applied externally as an antiseptic to ulcers and wounds in cattle. The leaves are used in chutneys in some parts of India.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956), CSIR (1948–1992), Seetharam *et al.* (1999), Sivarajan and Balachandran (1994), Yoganarasimhan (1996).

Emilia sonchifolia (L.) DC.

Botanical synonym

Cacalia sonchifolia L.

Common names

Bengali: sadhimodi, sudhimudi; ***Hindi***: hirankhuri; ***Malayalam***: mulshevi; ***Marathi***: sadamandi; ***Sanskrit***: sasasruti, sasarutih.

Description

A slender, erect or diffuse annual herb up to 40 cm tall. Leaves very variable: the lower petioled, lyrate or obovate, toothed or entire; the upper (cauline leaves) more or less amplexicaul and auricled, usually acute. Flowers pink or purplish, borne in solitary or corymbose heads up to 1.3 cm long; peduncles very slender, nodding when young; involucre cylindrical; bracts almost equalling the corolla, linear-oblong, acute. Achenes 0.3 cm long, narrowly oblong, 5-ribbed, brown, scabrid on the ribs, attached to a white, soft pappus. Flowers and fruits between September and December in western Maharashtra.

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Distribution and habitat

Found in most tropical and subtropical regions worldwide. Common in cultivated fields and other open, disturbed habitats throughout most of India up to 1200 m elevation.

Medicinal properties and uses

The plant is sudorific and is applied to relieve cuts and wounds. The crushed leaves are used externally to promote healing of breast abcesses among tribal women in western Maharashtra. The juice of the fresh leaves is used to relieve sore ears, sore eyes and night blindness. Among the tribal inhabitants of Surguja District in eastern Madhya Pradesh, the leaves are rubbed on the forehead to relieve headaches. A decoction of the plant is used as a febrifuge, to treat infantile tympanites, and mixed with sugar for bowel complaints. The root is used to treat diarrhoea. The root juice, mixed with salt and water, is used to treat cataracts and redness of the eyes. The herb is used as a salad plant before flowering, and the stem-leaves are cooked and eaten as a vegetable; they have a slightly bitter and acidic, though delicate, flavour.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Kumar and Jain (1998), Upadhye *et al.* (1994), Yoganarasimhan (1996).

Glossocardia bosvallea (L. f.) DC.

Botanical synonyms

Glossocardia linearifolia Cass., *Verbesina bosvallea* L. f.

Common names

Hindi: seri; ***Kannada***: parpataka; ***Marathi***: patharasuva, patharsuva; ***Sanskrit***: pithari; ***Telegu***: parapalanamu.

Description

A diffusely branched, usually prostrate, annual herb up to 25 cm long with deeply grooved stems and branches. Leaves alternate, 1.3–5 cm long, slender, divided into narrow segments; segments linear, apiculate; petioles variable in length, slender. The crushed leaves have the scent of fennel. Flowers yellow, borne in small terminal or

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axillary heads 1 cm long; outer involucral bracts usually 3, ovate-lanceolate, acute, *c.* 3 mm long with membranous and slightly ciliate margins and a green midrib; inner involucral bracts 6–8 mm long, oblong, sub-obtuse, striate, glabrous with pale membranous margins; pappus composed of 2 stiff, slightly divaricate awns. Achenes 6 mm long, brown, narrowly oblong, flattened, densely hairy on the edges. Flowers and fruits from July to September.

Distribution and habitat

Found throughout the plains of northern and western India southwards through peninsular India to Kerala and Tamilnadu, commonly in drier regions on sandy soils.

Medicinal properties and uses

The plant is used as an emmenagogue. In Ayurveda it is used as a substitute for *Oldenlandia corymbosa* (*Rubiaceae*). Among the tribal inhabitants of western Maharashtra, a decoction of the plant is used as febrifuge. A paste of the fresh plant is applied to promote healing of sores and wounds. It has a bitter taste and fennel-like odour; sometimes eaten as a vegetable.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956), CSIR (1948–1992), Jha and Varma (1996), Upadhye *et al.* (1994), Yoganarasimhan (1996).

Glossogyne bidens (Retz.) Alst.

Botanical synonyms

Glossogyne pinnatifida DC., *Zinnia bidens* Retz.

Common name

Gujarati: pardeshibhangro.

Description

A perennial glabrous herb with numerous stems arising from a fusiform root. Basal leaves 5–15 cm long including petiole, divided into 3–7 linear-lanceolate segments 0.5–3 cm long and 1–3.5 mm broad, acute at apex; cauline leaves similar, smaller, uppermost simple, scale-like. Flowers yellow, borne in heads (capitula); ray flowers *c.* 12, ligules broadly ovate; disc flower corollas 4-lobed, 2.5–2.8 mm long. Fruits (achenes) dark brown or blackish, linear-oblong, 6–7 mm long, 5-ribbed on both surfaces; awns divergent, brown, 2–3 mm long.

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Distribution and habitat

Found in the western and northern parts of India, from Punjab to Bengal and southwards through peninsular India and in Sri Lanka to an elevation of about 600 m, mostly in the plains.

Medicinal properties and uses

Among the Santhalis and Paharia of eastern Bihar, the extract from the whole plant is given to expel intestinal worms. The roots are reportedly used by the Oraons to relieve toothache. A preparation of the root is reportedly used to treat snake bites and scorpion stings.

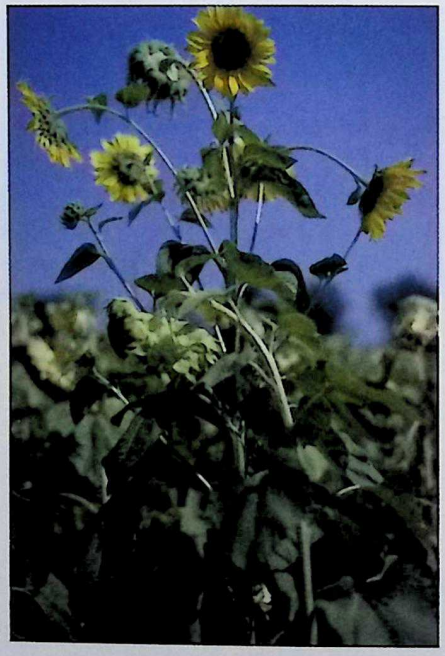
References

Asolkar *et al.* (1992), Chopra *et al.* (1956), CSIR (1948–1992), Kumar and Goel (1998), Yoganarasimhan (1996).

Helianthus annuus L.

Common names

Bengali: shuriamukti, surajmukhi; ***English***: sunflower; ***Gujarati***: surajmukhi; ***Hindi***: surajmukhi, surjamukhi; ***Kannada***: surya kanthi hoovu, suryakanti; ***Konkani***: jirasol, suriakamal; ***Malayalam***: suryakanti; ***Marathi***: brahmoka, surajamakha, suryaphul; ***Sanskrit***: suriamukhi, suryamukhi; ***Tamil***: suryakanti; ***Telegu***: adityabhaktichettu, poddatringuddachettu; ***Urdu***: surajamakkhi.



Description

An annual herb with an erect, rough, hairy stem, to 4.5 m tall. Leaves 10–30 cm long, alternate, long-stalked, broadly ovate to cordate, coarsely toothed, roughly pubescent on both surfaces. Flower heads usually 7.5–15 cm wide, to 30 cm in some cultivated varieties; ray florets yellow; disc florets brownish-purple. Fruits (achenes) cylindrical, obovoid-compressed, 1 cm long and 0.6 cm wide, white, black or striped grey and black.

Distribution and habitat

Unknown in its wild state, the species is considered to have originated from *Helianthus lenticularis* Douglas, a wild plant indigenous to Mexico. *Helianthus annuus* has long been grown worldwide as an ornamental plant and as a crop for its tasty seeds and edible seed oil, and as a forage crop. Numerous horticultural varieties have been developed.

Medicinal properties and uses

In Ayurveda the flower is considered to be anthelmintic and antiperiodic; it is reportedly used to treat skin diseases, itching, ulcers, leprosy, hysteria, biliousness, asthma, bronchitis, burning sensation in the vagina, urinary discharges and anaemia. The seeds are diuretic and expectorant; they are used to treat bronchial, laryngeal and

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pulmonary affections, coughs and colds. In Unani medicine a decoction of the root is used to strengthen teeth and cure toothache, the leaves are applied to relieve lumbar pain, and the flowers are considered useful for treating piles, ophthalmia and kidney diseases. In Siddha, the flower and seed are used to treat arthritis and dropsy. In China, the seeds are administered in the treatment of dysentery.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

Parthenium hysterophorus L.

Common name

Kannada: parthenium gida.

Description

An annual herb up to 1 m tall with a longitudinally grooved stem. Leaves alternate, sessile, irregularly dissected, pubescent. Florets white, borne in terminal or axillary, peduncled, paniculate heads approximately 0.5 cm in diameter. Achenes broadly obovoid, narrowed below, compressed, dark brown; pappus comprising 2 awns. Flowers and fruits throughout the year.

Distribution and habitat

Native to tropical and subtropical America, found in India as a weed in many parts of the country.

Medicinal properties and uses

Among the rural inhabitants of Bhavnagar District in Gujarat, a decoction of the whole plant is used to treat fever. In tropical America the plant is reported to be used as an a tonic, febrifuge, emmenagogue and as an analgesic in neuralgia. A decoction of the root is used in the treatment of dysentery.

References

Bhatt *et al.* (1999), CSIR (1948–1992), Yoganarasimhan (1996).

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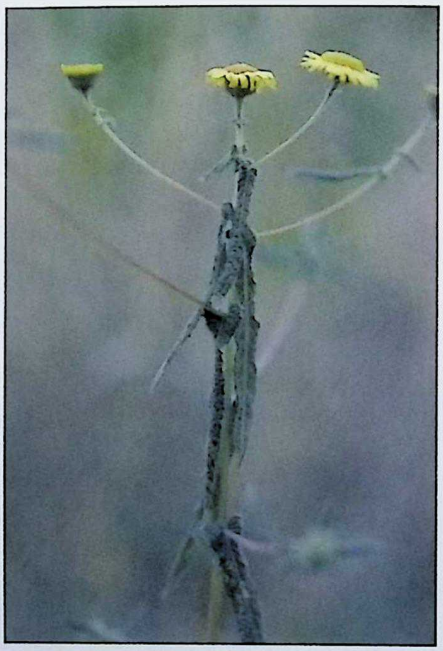
Pentanema indicum Ling



Botanical synonyms

Vicoa auriculata Cass., *V. indica* (L.) DC.

Common names

Gujarati: sona sali; ***Kannada***: hannavarikasoppu, mugutisoppu; ***Tamil***: jimikipoo, mookuti, poondu.

Description

An erect herb with reddish, sparsely puberulous stems. Leaves ovate-lanceolate, cordate, auriculate, sessile. Flower heads yellow, solitary, terminal or leaf-opposed. Achenes angled. Flowers throughout the year.

Distribution and habitat

Found in the deciduous forest zones throughout most of India to an altitude of 1800 m in the Himalayas, commonly on roadsides and in abandoned fields, particularly on drier sites. Also occurs in Sri Lanka, Thailand, China and west tropical Africa.

Medicinal properties and uses

The fresh roots are chewed to relieve abdominal pain among the Bondo tribal inhabitants of southern Orissa. A decoction of the roots is used by the Kondhs of southwestern Orissa for relief of fevers in children. Elsewhere, the roots are used to relieve scorpion stings. The inflorescence is used for treating throat disorders. The whole plant reportedly shows antifertility activity. Among the tribal inhabitants of southern and eastern Bihar, it is used in the form of a decoction by women as an oral contraceptive. A paste of the plant is used to treat bone fractures among the Paharia in southern Bihar.

References

Aminuddin and Girach (1991), CSIR (1948–1992), Girach (1992), Jha and Varma (1996), Varma (1997), Yoganarasimhan (1996).

Pseudognaphalium luteo-album (L.) Hillard & Burtt

Botanical synonym

Gnaphalium luteo-album L.

Common names

English: cottonweed, Jersey cudweed; ***Punjabi***: balraksha.

Description

A variable, more or less woolly annual herb, 15–45 cm tall; branches often tufted. Leaves alternate, sessile, woolly on both surfaces, 2.5–6.3 cm long and 0.3–1.3 cm wide, margins entire or very rarely obscurely toothed; lower leaves oblong-spathulate and upper ones lanceolate. Flower heads golden yellow or pale brown, in dense corymbose clusters; involucral bracts shining, straw-coloured, the outer ovate, the innermost linear; achenes oblong, papillose.

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Distribution and habitat

A pantropical weed, found throughout India to an altitude of about 3000 m in the Himalayas and Western Ghats.

Medicinal properties and uses

In Punjab the leaves are used as an astringent and vulnerary. The plant is also considered diuretic, haemostatic and cholagogue. The tomentum is applied externally as a counter-irritant in the treatment of gout.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

Senecio tenuifolius N. Burman

Botanical synonym

Doronicum tenuifolium (N. Burman) Wight

Common names

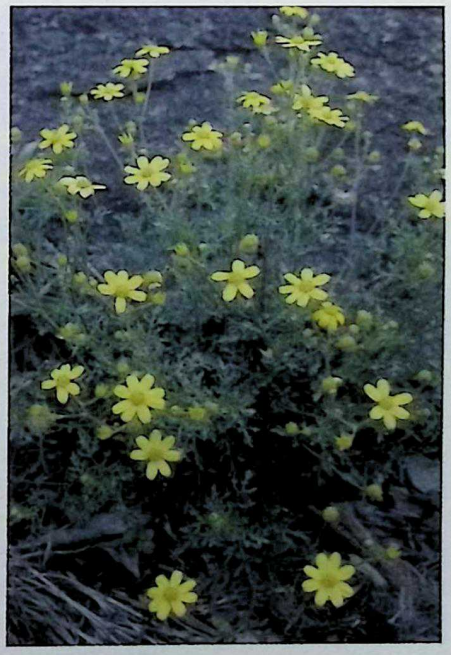
Punjabi: mentog, nimbar, sanggye.

Description

A slender, glabrous, usually much-branched annual herb 15–45 cm tall. Leaves sessile, pinnatifid; segments slender, spreading, obtuse. Flower heads 0.6–0.8 cm in diameter, in divaricating corymbs, rayed; peduncles slender, glabrous, with a few scattered bracts; involucral bracts 10–13, oblanceolate, 3–4 mm long, acute or acuminate, with broad margins and yellowish nerves; ligules 6–10; pappus copious, yellowish, as long as the achenes. Achenes of the ray flowers elongate, those of the disc flowers narrowed at the base, 0.3 cm long, hairy with white hairs on the ribs, brown. Flowers between August and October.

Distribution and habitat

Commonly found in the dry hills of southern India from southern Maharashtra to Kerala and eastwards through Karnataka and Tamilnadu up to an altitude of 1500 m.



Medicinal properties and uses

The leaves are used as an emollient and vulnerary.

References

Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

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Sigesbeckia orientalis L.

Botanical synonym

Sigesbeckia brachiata Roxb.

Common names

Gujarati: pilibadkadi; ***Kannada***: antuhuvinagida; ***Tamil***: kadambu, katampam; ***Telegu***: kadambu, katampam.

Description

An erect, pubescent, aromatic annual herb up to 1.2 m high; stem and branches tinged with purple, terete, pubescent. Leaves opposite, 5–12 cm long and 3.2–7 cm wide, triangular-ovate, apex acute or acuminate, margins deeply and irregularly toothed (uppermost leaves much smaller and nearly entire), finely pubescent on both surfaces, base cuneate, 3-nerved, leaf-stalk winged. Flowers yellow (rarely white), those of the ray red beneath, few to many in small paniculate heads in sticky, leafy panicles. Achenes black, obovoid, glandular, enclosed in boat-shaped bracts.

Distribution and habitat

Pantropical and subtropical in distribution, it is common in disturbed moist forests and open habitats throughout India to 2500 m elevation in the Himalayas.

Medicinal properties and uses

The plant is highly valued in traditional Indian medicine as a depurative and as an external application in the treatment of gangrenous ulcers and sores. A paste of the plant is used by the Uraon in southern Bihar to promote healing of boils and ulcers. The fresh juice, when applied as a dressing over wounds, leaves a varnish-like coating as it dries. A tincture of the plant is used externally with glycerine to cure ringworm and other parasitic infections. It has been used to treat rheumatism and renal colic. It is considered to be cardiotonic, diaphoretic, antiscorbutic and sialagogue, and is sometimes employed as an anthelmintic. An extract of the plant is credited with hypoglycaemic and antiviral properties. Among the Rabari in the Barda Hills of Gujarat, the leaf juice is reportedly used to treat diseases of the urinary tract.

References

Chopra *et al.* (1956), CSIR (1948–1992), Jadeja (1999), Kirtikar *et al.* (1935), Varma (1997), Yoganarasimhan (1996).

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Sphaeranthus indicus L.

Botanical synonym

Sphaeranthus hirtus Willd.

Common names

Bengali: chagulnadi, ghorkmundi, gorakhmundi, mundi, murmuriya; ***Gujarati***: bodiokalara, gorakhmundi, mundi; ***Hindi***: gorakhmundi, mundi; ***Kannada***: bodu kadale soppu; ***Malayalam***: atakkamaniyan, attakkamanni, mirangani; ***Marathi***: barasavodi, gorakhamundi, mundi; ***Oriya***: bokashungi, buikadamba, murisa; ***Punjabi***: ghundi, khamadrus, mundibuti, zakhmihaiyat; ***Sanskrit***: hapusa, mundi, mundirika, sravani; ***Tamil***: kottakaranthai, kottakkarandai; ***Telegu***: bodasoram, boddasoramu, boddatarupu; ***Urdu***: kamdaryus, mundi.

Description

An aromatic herb 30–60 cm high with glandular-hairy stems and branches; stems with toothed wings. Leaves sessile, decurrent, 1–5 cm long and 0.4–2.2 cm wide, obovate-oblong, rounded or subacute at apex, margins spinous-serrate or dentate, narrowed at the base, glandular-hairy. Florets purple, borne in compact globose-ovoid heads 1–1.6 cm in diameter on glandular peduncles with toothed wings; involucral bracts linear, acuminate, pubescent and ciliate near the ends; achenes glabrous, stalked.

Distribution and habitat

Widely distributed in tropical Africa, South Asia, China and Malaysia. Very common in damp habitats at lower elevations throughout India and to an altitude of 1500 m in northern India.

Medicinal properties and uses

All parts of the plant are used for medicinal purposes. In Ayurveda, the whole plant is used to treat a variety of diseases and conditions, including anorexia, jaundice, diseases of the spleen, piles, worm infestations, blood disorders, oedema, scrofula, filariasis, elephantiasis, dysuria and fever. Ayurvedic physicians in Kerala use this plant as the source of *Hapusa*, a drug used to improve digestion and to treat abdominal tumours, indigestion, colic, piles, hydrocele, diarrhoea, impotence, leucorrhoea and skin conditions. In Unani medicine the plant is considered tonic, laxative and emmenagogue, and is used to treat sore eyes, jaundice, gleet, biliousness, boils and scabies; the oil from the root is considered aphrodisiac and used to treat prolapsus ani. In Siddha, the root, leaf, flower and seed are variously used to treat eczema and other skin diseases, worm infestations, piles and as an aphrodisiac and rejuvenator. The juice of the crushed plant is styptic and believed to be useful for treating liver and gastric disorders. An infusion of the plant is given as an anthelmintic and also as a blood-purifier among the tribal inhabitants of eastern Bihar. The paste of the herb, made with oil, is applied externally to relieve itching. The powdered seeds and roots are given as an anthelmintic. A decoction of the root is used to treat chest

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pains, cough and bowel complaints. The root bark, mixed with whey, is said to be useful as an application for piles. Among the Kondhs of southwestern Orissa, the dried, powdered root, mixed with ground black pepper, is used to treat dysentery. Flowers are credited with alterative, cooling and tonic properties; they are reportedly eaten to treat conjunctivitis. A decoction of the leaves and flowers is used by the Irulars in Tamilnadu for its cooling effect. The leaf juice, boiled with milk and sugar, is prescribed for cough. The leaves are edible and used as a pot-herb.

References

Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Girach (1992), Jha and Varma (1996), Ragupathy and Mahadevan (1991), Sivarajan and Balachandran (1994), Yoganarasimhan (1996).

Spilanthes calva DC.

Botanical synonyms

Spilanthes acmella var. *calva* (DC.) C.B. Clarke, *S. acmella* auct. non L., *S. pseudo-acmella* auct. non (L.) Murr.

Common names

Kannada: dodda vana mugali, hemmugulu, vanamugali; ***Malayalam***: kuppa manjet; ***Marathi***: akkalkara, pipulka; ***Punjabi***: akarkarha, pokormul; ***Telegu***: maratimogga, maratiteega, maratitige.

Description

An annual herb up to 60 cm tall. Stems erect or decumbent at base, more or less hairy. Leaves opposite, triangular ovate or lanceolate, margins dentate or almost entire, sparsely pubescent beneath. Flower heads ovoid, pale yellow or white, long-peduncled, solitary or in terminal panicles. Achenes obovate to trigonous with ciliate edges.

Distribution and habitat

Occurs in moist habitats in the plains and lower hill regions throughout India and Sri Lanka, Java and the Lesser Sunda Islands.

Medicinal properties and uses

The plant, boiled in water, is used to treat dysentery. The decoction is also given as a diuretic and lithotriptic and used as a bath for relieving rheumatism and as a lotion for scabies and psoriasis. The juice from the plant is a vulnerary. The pounded herb is used as a poultice to dress wounds. The

pungent flower heads are chewed to relieve toothache and affections of the gums and throat, and paralysis of the tongue; it is also used to treat stammering in children in western India. A tincture made from the flower heads is used as a substitute for the tincture of pyrethrum (prepared from the roots of *Anacyclus pyrethrum*: *Asteraceae*) to treat inflammation of the jaw and dental caries. The roots are purgative. The crushed plant is used as a fish poison.

References

Chopra *et al.* (1956), CSIR (1948–1992), Yoganarasimhan (1996).

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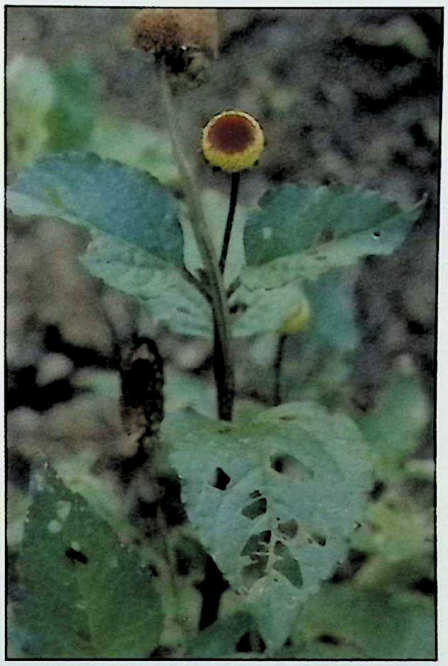
Spilanthes oleracea L.



Botanical synonym

S. acmella var. *oleracea* C.B. Clarke

Common names

Bengali: roshunia; ***English***: Brazilian cress, Pará cress; ***Hindi***: pakormul, pokarmul, ukra; ***Konkani***: acharbondi, pipulka; ***Kannada***: vana; ***Marathi***: acharbondi, pipulka; ***Punjabi***: pakarmul; ***Sanskrit***: akalkar, maharashtri, sarahattika; ***Tamil***: ukra; ***Telegu***: maratimogga, maratitige.

Description

A perennial herb, closely related to *Spilanthes calva*, but more robust, succulent, and with larger flower heads. Leaves triangular or triangular-ovate, obtuse, attenuate below. Florets reddish-brown; achenes scabrid.

Distribution and habitat

Introduced from Brazil and cultivated in gardens as an ornamental and for its pungent leaves which are used in salads. Sometimes naturalized.

Medicinal properties and uses

The whole plant is very acrid, the flower heads particularly so, causing profuse salivation when chewed. They are used to treat headaches, paralysis of the tongue, affections of the throat and gums, and for toothache. A tincture of the fresh as well as the dried herb is also used to relieve toothache, scurvy and gum troubles, and is taken internally to treat gout and bladder pain.

References

Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935).

Synedrella nodiflora (L.) Gaertn.

Botanical synonyms

Verbesina nodiflora L., *Xymenesia encelioides* auct. non Cav.

Common name

Malayalam: mudiyendra pacha.

Description

A small, erect, annual herb 25–50 cm tall with grooved stems. Leaves opposite, broadly ovate-elliptic, hairy. Flower heads yellow, heterogamous, sessile, axillary and between forks of branches. Achenes black, ribbed; pappus of 2–3 bristly awns.

Distribution and habitat

Apparently native to Mexico, Central America and the Caribbean and naturalized in many parts of tropical Asia from India and Sri Lanka to southern China, Malaysia and Polynesia. In India it is a common

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weed of cultivated lands and roadsides in the plains from Bihar to Assam southwards to South India and the Andamans.

Medicinal properties and uses

The leaves are used as a poultice to relieve sore legs and for the preparation of an embrocation to treat rheumatism. The juice of the leaves is used to treat earache. The tender, edible leaves are used as a laxative.

References

Chopra *et al.* (1956), CSIR (1948–1992), Yoganarasimhan (1996).

Tagetes erecta L.

Common names

Bengali: genda; ***English***: Aztec marigold, French marigold; ***Gujarati***: guljharo, makhanala; ***Hindi***: genda, gulatora, gultera, kalaga, lalamuraga, makhamali; ***Kannada***: chandumallige, seemeshamantige, seeme shavantige; ***Malayalam***: chendumalli; ***Marathi***: makhamala, rojiachaphul, zendu; ***Oriya***: gendu; ***Punjabi***: genda, mentok, tangla; ***Sanskrit***: jhandu, sthulapushpa, zandu, zanduga; ***Tamil***: tulukka-samandi; ***Telegu***: banti, bantichettu; ***Urdu***: genda.

Description

An erect, stout, branching herb 15–60 cm tall with glabrous angular stems. Leaves strong-scented, pinnately divided, 2.5–15 cm long; segments 11–17, lanceolate, 1–5 cm long and 0.2–1 cm wide, acute or attenuate at apex, attenuate at base, margins serrate. Flower heads solitary, lemon-yellow to orange, 5–10 cm across; rays many, long-clawed, sometimes 2-lipped or quilled, involucre campanulate. Achenes 6–7 mm long, pappus scaly.

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Distribution and habitat

Native to Mexico, extensively cultivated in gardens throughout the tropics and subtropics; occasionally naturalized in India.

Medicinal properties and uses

An infusion of the plant is used to treat rheumatism, colds and bronchitis. In Unani medicine the leaves are considered useful for treating piles, kidney troubles and muscular pain; their juice is used for treating earache and ophthalmia. The leaves are applied externally in the form of a hot leaf poultice to relieve boils and carbuncles. The leaves and florets are used as an emmenagogue, and their infusion is prescribed as a vermifuge, diuretic and carminative. The florets are used in the treatment of eye diseases and ulcers, and their juice is taken internally to relieve bleeding piles. In Ayurveda the flowers are considered useful for treating fevers and epileptic seizures. An extract of the root is credited with laxative properties. The roots and seeds are purgative. The flowers are much used in Hindu religious ceremonies for decorative purposes.

References

Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935), Neher (1968), Yoganarasimhan (1996).

Tridax procumbens L.

Common names

English: coatbuttons, Mexican daisy; ***Gujarati***: panaphad, pardeshi bhangro; ***Hindi***: khal-muriya, tal-muriya; ***Kannada***: gabbu sanna shavanti, karibelli, nettu gabbu savanthi; ***Oriya***: bisalyakarani; ***Sanskrit***: jayanti; ***Tamil***: vettukayapoondu, vettukkaayathalai; ***Telegu***: kampuchemanti, raavanaasuruditalakaai.

Description

A hispid, procumbent herb up to 60 cm tall; base woody, sometimes rooting at the nodes. Leaves ovate, 2–7 cm long and 1–4 cm wide, apex acute or acuminate, base cuneate, margins serrate to coarsely dentate or trilobed; petioles to 3 cm long. Flowers borne in small, solitary, terminal heads; peduncles 10–20 cm long; ray florets strap-shaped, white; disc florets yellow. Achenes black, turbinate, 2–2.5 mm long with feathery pappus.

Distribution and habitat

Native to tropical America and now widespread and naturalized in many parts of the tropics and subtropics. It is found as a weed in cultivated and other disturbed habitats throughout India to an altitude of 2400 m.

Medicinal properties and uses

The leaves are reportedly used to treat bronchial catarrh, dysentery and diarrhoea, and as a hair restorative. In southern Orissa a paste prepared from the whole plant is taken orally to relieve diarrhoea. A fine paste of the leaves is applied externally to reduce swelling of haemorrhoids by the Uraon in southern Bihar. The leaf powder mixed with

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that of *Cicer arietinum* (*Fabaceae-Papilionoideae*) in a 2 : 1 ratio, is taken orally to treat diabetes among the tribal inhabitants of Udaipur District in Rajasthan. The leaf juice posesses antiseptic, insecticidal and parasiticidal properties and is used externally to stop bleeding from cuts, bruises and wounds, and to relieve burns. It is also taken as a male aphrodisiac in northeastern Karnataka. The powdered roots, mixed with castor oil (seed oil of *Ricinus communis*: *Euphorbiaceae*), is applied externally to relieve rheumatic pain among the Kondhs of southwestern Orissa. In Ayurveda, the plant is considered a substitute for *Bhrngaraja* (*Eclipta prostrata*: *Asteraceae*), the whole plant and seeds being used to treat a variety of ailments. The leaves are cooked and eaten as a vegetable.

References

Aminuddin and Girach (1991), Bhatt and Mitaliya (1999), Bhatt *et al.* (1999), CSIR (1948–1992), Girach (1992), Katewa and Arora (1997), Mohanty *et al.* (1996), Ragupathy and Mahadevan (1991), Seetharam *et al.* (1999), Varma (1997), Yoganarasimhan (1996).

Vernonia cinerea Less.

Botanical synonyms

Conyza cinerea L., *Vernonia albicans* auct. non DC.

Common names

Bengali: kalajira, kuksim; ***English***: ash-coloured fleabane, purple fleabane; ***Gujarati***: sadodi, sadori, sahadevi, sedardi, shedardi; ***Hindi***: dantotpala, sadodi, sadori, sahadevi; ***Kannada***: kare hindee, sahadevi; ***Malayalam***: puvankodanthel, puvamkuruntal; ***Marathi***: osari, sadodi, sahadevi; ***Punjabi***: sahadevi; ***Sanskrit***: sahadevi; ***Tamil***: mukuttipundu, puvankodanthel, sahadevi, sirashangalanir; ***Telegu***: garitikamini, garitikamma.

Description

An erect or rarely decumbent herb 15–75 cm tall with slender, grooved and ribbed stems. Leaves 2.5–5 cm long and 2–3.8 cm wide, variable in shape, broadly elliptic or lanceolate, apex obtuse or acute, base cuneate, margins irregularly toothed or shallowly crenate-serrate, membranous to coriaceous, sparsely hairy on both surfaces; petioles variable, 6–13 mm long. Florets pinkish-purple, heads about 20-flowered, 6 mm in diameter, forming rounded or flat-topped, paniculate, terminal or axillary, corymbs, with a minute linear bract beneath each head of flowers and with small bracts in the forks of the peduncles; pappus white, about 0.5 mm long. Achenes *c.* 1.3 mm long, 3–4-angled, densely silky pubescent, slightly narrowed at base. Flowers and fruits throughout the year.

Distribution and habitat

Found throughout the Indo-Malaysia region, tropical Africa, Australia and New Zealand.

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It is one of the most common weeds in India, found throughout the country to an altitude of 2500 m in the Himalayas.

Medicinal properties and uses

One of the ten herbs constituting the group known as *Dasapuspa* in Ayurveda, the plant is considered febrifuge, diaphoretic, alterative and useful for purifying the blood, bile and semen. It is used as a specific for leucorrhoea, menorrhagia, and in the treatment of chronic skin diseases, dysuria, strangury, bladder stones, piles, worms and haematological disorders. A decoction of the plant is prescribed to promote perspiration in fevers, and its infusion is used in combination with quinine to relieve malarial fevers. Among the rural inhabitants of Bhavnagar District in Gujarat, its decoction, or infusion of the leaves, is also used to treat cough, insomnia and diarrhoea. In Siddha, the whole plant is reportedly used in the treatment of leucorrhoea, skin diseases, stomatitis, thirst, vomiting, coryza and fainting. The juice of the plant is given to children to control incontinence in urination and to relieve piles. The leaf juice is given for treatment of amoebiasis and a poultice of the leaves is used against humid herpes, eczema and ringworm and for the extraction of guinea worms. The leaf juice is boiled with oil and used for the treatment of elephantiasis. The root is bitter and used as an anthelmintic and to treat dropsy; in Ayurveda, it is prescribed in the treatment of fever, boils, eye diseases, blood disorders, worm infestation and as a sedative. Its decoction is given to relieve diarrhoea and stomach-ache, and the juice of the root for cough and colic. The flowers are used to treat fevers, rheumatism and conjunctivitis. The seeds are commonly used as an anthelmintic and alexipharmic, and are said to be effective against roundworms and threadworms. They are also given to treat leucoderma, psoriasis and other chronic skin diseases. Made into a paste with lime juice, the seeds are used for destroying lice.

References

Bhatt and Mitaliya (1999), Bhatt *et al.* (1999), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935), Sivarajan and Balachandran (1994), Varma (1997), Yoganarasimhan (1996).

Xanthium indicum Koenig

Botanical synonyms

Xanthium orientale auct. non L., *X. strumarium* L.

Common names

Bengali: banokra, chotadhatura; ***English***: burweed, cocklebur; ***Gujarati***: gadariyu, gadariyun, gadriyun; ***Hindi***: adhasisi, banokra, chhotadhatura, chhotagokhru, gokhru; ***Kannada***: marul ummathi; ***Marathi***: dumundi, dutundi, sankeshwara, shankeshvara; ***Punjabi***: chiru, sungtu, wangan tsuru; ***Sanskrit***: arishta; ***Tamil***: marlumutta, maruloomatham; ***Telegu***: marulamathangi, marulutige, parsvapu, talnoppi.

Description

An erect, unarmed annual herb up to 1.5 m tall; stem short, rough with short hairs. Leaves 5–7.5 cm long and almost as wide, broadly triangular-ovate or suborbicular, scabrid or hispid on both surfaces, apex acute, often 3- to 5-lobed, irregularly serrate, base somewhat cordate or shortly cuneate; petioles 2.5–7.5 cm long. Flower heads numerous, white or green, in terminal and axillary racemes; male heads globose; female heads ovoid, covered with hooked bristles, ending in 2 strong hooked beaks. Achenes 1.3 cm long, obovoid, compressed, enclosed in a hard involucre.

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Distribution and habitat

Apparently native to tropical America, it is widely introduced and naturalized throughout the tropics and subtropics. Commonly found in disturbed habitats such as agricultural fields, roadsides and rubbish heaps at lower elevations throughout India to an altitude of 1500 m in the Himalayas.

Medicinal properties and uses

The herb is credited with powerful diaphoretic, emollient, diuretic and sedative properties. In Ayurvedic practice the whole plant is considered cooling, laxative, fattening, anthelmintic, alexiteric, alterative, tonic, digestive and antipyretic; it is used for treating leucoderma, epilepsy, biliousness, fever, anaemia and jaundice. Its decoction is recommended for treatment of chronic malaria, leucorrhoea and urinary diseases. It is used as a styptic and is considered a prophylactic against hydrophobia. The leaves are reported to possess astringent, alterative, anti-syphilitic and diuretic properties, and are also used for treatment of scrofula and herpes. The fruits are rich in vitamin C and are considered to be cooling and demulcent in traditional Indian medicine. They are said to be effective in the treatment of smallpox. Among the rural inhabitants of Bhavnagar District in Gujarat, the fruits are used for treating malaria, urinary troubles, kidney stones and scurvy. The air-dried young fruits are used in pharmaceutical preparations for regulation of hormonal activity and treatment of urogenital diseases. The seeds are used for relieving inflammatory swellings and the oil expressed from them for treating bladder affections, herpes and erysipelas. In Siddha, the seed is used for treating venereal diseases. The root is a bitter tonic and has been used for treatment of cancer and scrofula. Its extract is used externally to promote healing of ulcers, boils and abscesses. The plant is also used in traditional medicine in Europe, China, Southeast Asia and tropical America.

Warning

The aerial parts of the plant contain numerous unidentified alkaloids which are believed to be toxic. The pollen has been found to cause asthma and rhinitis, and produces dermatitis in susceptible persons.

References

Bhatt and Mitaliya (1999), Bhatt *et al.* (1999), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

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Balsaminaceae

Impatiens balsamina L.

Botanical synonyms

Impatiens arcuata Wall., *I. cornuta* L.

Common names

Bengali: dupati; ***English***: balsam weed, garden balsam, jewel weed, touch-me-not; ***Gujarati***: gulmendi, pantambol; ***Hindi***: gulmendhi; ***Malayalam***: mecchingom; ***Marathi***: terada; ***Oriya***: haragaura; ***Punjabi***: bantil, halu, juk, pallu, tilphal; ***Sanskrit***: dushpatrijati, tairini; ***Tamil***: kasittumbai; ***Urdu***: gulemendi.

Description

An erect, branched, succulent annual herb 30–90 cm tall with erect, simple or sparsely branched stems, pubescent when young. Leaves spirally arranged, narrowly lanceolate to narrowly elliptic, 2.7–9 cm long and 1.1–2.6 cm wide, base cuneate, apex acute, margins serrate with several dark, sessile glands towards the base of the blade, sessile or short-petiolate (0.2–1.3 cm). Flowers solitary or fascicled, purple, pink or nearly white, with long, slender, incurved spurs. Fruits broadly fusiform, 1.2–2 cm long and 0.6–0.8 cm wide, densely tomentose. The edible seeds are globose, tubercled, about 0.5 cm in diameter.

Distribution and habitat

Found throughout most of the tropical and subtropical parts of India and in mainland Southeast Asia, to an elevation of approximately 1600 m, typically growing gregariously in the forest understorey. Several varieties are cultivated in gardens.

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Medicinal properties and uses

The medicinal properties of the plant are said to resemble those of *Impatiens pallida* and *I. nolitangere*, found in North America and Europe, the acrid juice of which is considered emetic, cathartic and diuretic. The whole plant is sometimes used externally to relieve pains in the joints. In Hawaii, the plant is used to treat ulcers. The flowers are mucilaginous and cooling and are used to treat lumbago and intercostal neuralgia, and are applied externally to relieve burns and scalds; they are also reported to improve circulation and relieve stasis. In China, powdered seeds are prescribed for a difficult labour. The flowers and their alcoholic extract possess marked antibiotic activity against some pathogenic fungi and bacteria.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935).

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Bignoniaceae

Bignonia capreolata L.

Botanical synonyms

Adenocalyma alliaceum Miers, *Anisostichus capreolata* (L.) Bureau, *Bignonia alliacea* Lam.

Common names

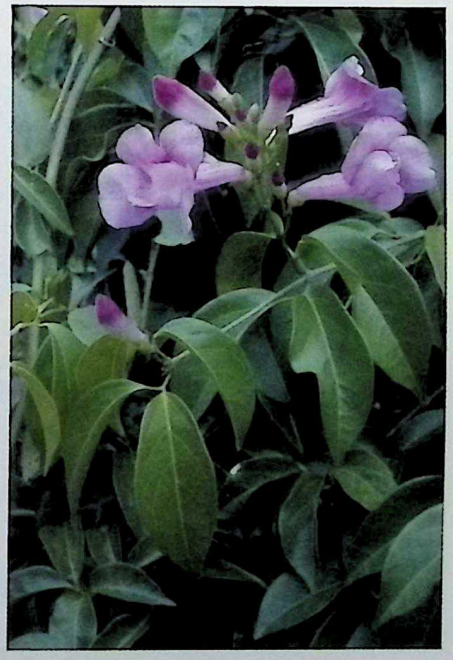
English: cross-vine, quarter-vine.

Description

A woody climber up to 10–15 m tall, the stem in cross-section exhibiting the wood-bundles in the form of a cross. Leaves opposite, compound, each consisting of a pair of stalked leaflets and a compound tendril with small clinging discs; leaflets oblong or elliptic, subacuminate at apex, entire, narrowed to a cordeate base; petioles 1–2 cm long. Flowers borne in fascicles, reddish or violet, calyx 0.5–0.8 cm long, corolla tube 5 cm long, widely tubular above a narrowed base. Fruits elongate, linear, flattened, 15–20 cm long; seeds flat, broadly winged at each side, 3 cm long.

Distribution and habitat

Native to North America (southeastern USA) and grown as an ornamental in Indian gardens.



Medicinal properties and uses

The root is used as a substitute for sarsaparilla, and its decoction is used as a detergent, aperient and diuretic.

References

Asolkar *et al.* (1992), CSIR (1948–1992).

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Dolichandrone falcata (Wall. ex DC.) Seeman

Botanical synonyms

Bignonia spathacea Roxb., *Spathodea falcata* Wall.

Common names

Hindi: hawar, mersing; ***Kannada***: godmurki, mududavudare, oodigida, udure, wudige; ***Malayalam***: nirpponnayyam; ***Marathi***: bhersing, medasingi, medsing, mersing, mersingi; ***Oriya***: mrygosingo; ***Sanskrit***: mesasrnga, visanika; ***Tamil***: kadalatti, kaliyacha, katuvarsana; ***Telegu***: chittavadi, cittivoddi, oddi, udda, wodi.

Description

A deciduous tree up to 15 m tall with smooth grey bark exfoliating in irregular scales; young twigs pubescent. Leaves opposite, imparipinnate, 7.5–15 cm long; leaflets 5–7, opposite, 1.3–3.6 cm long and wide, suborbicular or obovate, terminal leaflet sometimes shortly acuminate, pubescent or glabrous, base cuneate or rounded, usually unequal-sided; main nerves conspicuous beneath; lateral leaflet petiolules up to 2.5 mm long. Flowers white, trumpet-shaped with crisped lobes, borne in terminal, few-flowered racemes, 2.5 cm long or more. Fruit (capsule) flat, falcately curved, 25–45 cm long and 2 cm wide, glabrous; seeds rectangular, 2.5 cm × 0.6 cm, winged at both ends. Flowers and fruits between March and August in western Maharashtra. In central Indian deciduous forests, flowering occurs between April and June and fruiting from December to February; trees remain leafless from February–March to April–May.

Distribution and habitat

Commonly found in dry deciduous forests from Rajasthan to Bihar southwards through peninsular India to Tamilnadu, mainly on dry, rocky soils.

Medicinal properties and uses

The leaves are reportedly used to relieve body-aches and to treat snake bite in central India. Among the tribal inhabitants of western Maharashtra, the fresh leaf juice is taken to relieve stomach pain. In northeastern Karnataka, the leaves are powdered with sesame seeds and given with buttermilk to promote healing of bone fractures.

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References

Asolkar *et al.* (1992), Chopra *et al.* (1956), CSIR (1948–1992), Jain (1991), Kirtikar *et al.* (1935), Seetharam *et al.* (1999), Sivarajan and Balachandran (1994), Upadhye *et al.* (1994).

Kigelia africana (Lam.) Benth.

Botanical synonyms

Bignonia africana Lam., *Kigelia aethiopica* (Fenzl.) Decne., *K. pinnata* (Jacq.) DC.

Common names

English: common sausage tree; ***Hindi***: jhar phanoos.

Description

A medium-sized tree with a spreading crown, short trunk and rough, greyish-brown bark. Leaves imparipinnate; leaflets 7–9, elliptic-oblong or obovate, entire or serrate, 7.5–15 cm long. Flowers deep chocolate-red, borne in long pendulous panicles. Fruit gourd-like, up to 45 cm long; seeds many, embedded in fibrous pulp.

Distribution and habitat

Cultivated in many parts of India as an ornamental and roadside tree.

Medicinal properties and uses

The bark is used for treating rheumatism, dysentery and venereal diseases. The fruit

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is used in Africa for dressing ulcers and to treat syphilis and rheumatism. It also possesses purgative properties.

References

Asolkar *et al.* (1992), Chopra *et al.* (1969), CSIR (1948–1992).

Millingtonia hortensis L. f.

Botanical synonym

Bignonia suberosa Roxb.

Common names

Bengali: akas nim, cork-gach, mini-chambeli; ***English***: Indian cork tree; ***Hindi***: akaonim, akas nim, mini-chambeli, neem-chameli; ***Kannada***: beratu, biratumara; ***Malayalam***: katesam; ***Marathi***: akasnimb, kavala-nimb, kula nim, nimi-chambeli; ***Oriya***: bakeni, mach-mach, redli; ***Tamil***: katmalli, maramalli; ***Telegu***: akasmalli, kavuki.

Description

A tall tree up to 24 m tall with a straight trunk, elongated pyramidal crown with deep green foliage, and yellowish-grey, rough, corky bark. Leaves 2–3-pinnate; leaflets ovate-lanceolate, 2.5–5 cm long, margins sinuate. Flowers fragrant, white or pinkish with long slender corolla tubes, borne in drooping terminal panicles. Fruit (capsule) slender, linear, 30 cm long, compressed; seeds many, flat, winged. Flowers from September through to December; it is

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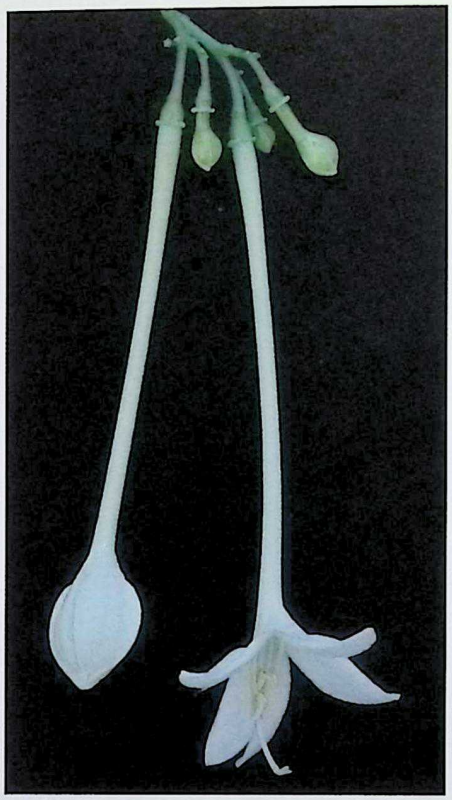

not known to fruit in central India. Trees are usually leafless between January–March and March–May.

Distribution and habitat

Believed to be indigenous to Myanmar (Burma). It is planted throughout India as a garden and roadside ornamental; occasionally naturalized.

Medicinal properties and uses

The bitter bark is reportedly used in Indonesia as an antipyretic.

References

Chopra *et al.* (1969), CSIR (1948–1992).

Oroxylum indicum (L.) Vent.

Botanical synonyms

Bignonia indica L., *Calosanthes indica* Blume, *Spathodea indica* Pers.

Common names

Bengali: nasona, sona, sonpati; ***English***: Indian trumpet flower; ***Gujarati***: aralu, podval, tentu, tetu; ***Hindi***: arlu, saona, sauna, ullu; ***Kannada***: alangi, bunepale, sonepatta, tigadu; ***Konkani***: dovondik; ***Malayalam***: aralu, arantal, palagapaiyani, palakapayani, veluttapatiri; ***Marathi***: taitu, tetu, ulu; ***Oriya***: fanafania, phapni, phonphonia, ponponia; ***Punjabi***: mulin, tatmorang, tatpalang; ***Sanskrit***: shyonaka, syonaka, syonakah; ***Tamil***: achi, pana, pei, peiarlanthei, vangam; ***Telegu***: dundilum, mokavepapampini, pampana, pampini; ***Urdu***: arlu.

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Description

A small deciduous tree up to 12 m tall, often irregularly branched; bark light brown, soft, with numerous corky lenticels, exuding green juice when cut. Leaves large, 0.9–1.5 m long, bipinnate or tripinnate, with opposite pinnae; leaflets 2–4 pairs, ovate or elliptic, 6.3–12.5 cm long and 3.8–10 cm wide, apex acuminate, base rounded or sometimes cordate; petiolules 6–15 mm long. Flowers lurid purple, fleshy, fetid-smelling, borne in large, erect racemes 30–60 cm long; pedicels 0.6–3.2 cm long; calyx 2.5 cm long, oblong-campanulate, glabrous; corolla up to 10 cm long, fleshy, lobes *c.* 3.8 cm long with crisped margins. Fruits (capsules) large, flat, straight or curved, tapering at both ends, 30–90 cm long and 5–9 cm wide, valves woody; seeds numerous, flat, thin, *c.* 6 cm long including the broad silvery wing. In central and western Indian deciduous forest zones, flowers between June and August; fruits ripen between December and March. In this region, trees remain leafless between November–December and June.

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Distribution and habitat

Occurs naturally from India and Sri Lanka eastwards through Southeast Asia to the Philippines and Indonesia. It is found throughout most of India to an altitude of 1200 m, usually in ravines and other moist habitats in deciduous forests and in evergreen forests of southern India; rare in dry, western areas. Occasionally planted near villages.

Medicinal properties and uses

Most parts of the tree are used medicinally. The fresh root bark is a well-known drug in Ayurvedic medicine as an ingredient of the compound formulation *Dasamula* ('ten roots'). It is considered to be hot, bitter, astringent, carminative, diuretic, stomachic, aphrodisiac and tonic, and useful for stimulating digestion, curing fevers, coughs and other respiratory disorders, for treating diarrhoea and dysentery, abdominal pain, rheumatism, thirst, vomiting, anorexia, worms, leprosy and other skin diseases. Boiled in sesame oil, it is recommended for otorrhoea. Its decoction is used by the tribal inhabitants of Sundargarh District in Orissa to treat dropsy and eruptive fevers. The powdered stem bark is given to treat fever among tribal inhabitants of southern Bihar; mixed with the powdered bark of neem (*Azadirachta indica*: *Meliaceae*) and *Entada rheedii* (*Fabaceae-Mimosoideae*) and leaves of *Radermachera xylocarpa* (*Bignoniaceae*), it is prescribed for leprosy by the inhabitants of Gandhamardan Hills in Orissa. The tender fruits are refreshing, and considered stomachic and anthelmintic in Ayurvedic medicine, used to treat heart and throat diseases, piles and bronchitis. The seeds are purgative; mustard oil in which the powdered seeds have been boiled is used as a rub to reduce joint pain in southern Bihar. The leaves are used externally for relieving enlarged spleen, headache and ulcers. Among the tribal inhabitants of Maharashtra, the crushed leaves are applied to relieve joint pains. A decoction of the leaves is used in Malaysia to relieve stomach-ache and rheumatism. The young shoots and unripe fruits are eaten as vegetables.

References

Brahmam and Saxena (1990), Chopra *et al.* (1956), CSIR (1948–1992), Girach and Aminuddin (1995), Mohanty *et al.* (1996), Mukherjee and Namhata (1990), Sivarajan and Balachandran (1994), Upadhye *et al.* (1994), Yoganarasimhan (1996).

Radermachera xylocarpa (Roxb.) K. Schum.

Botanical synonyms

Bignonia xylocarpa Roxb., *Spathodea xylocarpa* Brand., *Stereospermum xylocarpum* Benth. & Hook.

Common names

English: padri tree; ***Gujarati***: khadsing, padado; ***Hindi***: jaimangal, pural; ***Kannada***: ambalahude, anetantuvaluka, genasing, ghanashrynga, hulave, kanakakombu; ***Malayalam***: edankorna, patirevetamkaruna, vedangkonnai; ***Marathi***: bersinge, kadashing, kharsing; ***Oriya***: khonda-partoli; ***Sanskrit***: patala, svetapatala; ***Tamil***: mulaiutbi, pathiri, vadencarni, vedanguruni; ***Telegu***: nagadudilam, warawaili.

Description

A medium-sized tree up to 18 m tall with light grey, flaky bark. Leaves large, 0.3–1 m long, usually bipinnate or sometimes tripinnate; main rachis angular; leaflets 5–9, elliptic to ovate, 5–7.5 cm long and 2.5–3.8 cm wide, apex acute or acuminate, margins entire, base acute or rounded, often unequal-sided; petiolules 0–6 mm long. Flowers large, fragrant, borne in dense, tomentose, compound panicles appearing after the leaves; calyx 1.3 cm

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long, pubescent outside, lobes 3–5, irregular, short, broad; corolla 3.8–5 cm long, white tinged with yellow or pink, glabrous, tube narrow within the calyx then swollen upwards, limb somewhat oblique with rounded, crisped lobes. Fruits (capsules) 0.3–0.9 m long and 2.5–4 cm wide, subcylindrical, slightly curved, with many large, hard tubercles, valves woody, bearing seeds on shallow depressions; seeds thinly disc-shaped, about 3.2 cm long and 0.6 cm wide, including the thin, membranous wing.

Distribution and habitat

The tree is found throughout peninsular India from Gujarat to Bihar southwards, up to an altitude of about 1500 m. It usually occurs in deciduous forests, preferring more open sites.

Medicinal properties and uses

The plant is credited with antiseptic properties, and an oil or resin extracted from the wood is used to treat skin conditions. The bitter, astringent root bark is used as a substitute for that of *Stereospermum chelonoides* and *S. colais* in Ayurvedic practice. Among the inhabitants of the Gandhamardan Hills of Orissa, the root paste is used both as an external application and taken internally as an antidote to the bites of snakes, cats and mad dogs. Among the tribal inhabitants of Surguja District in northeastern Madhya Pradesh, the root juice and decoction of the pounded stem bark is given to treat snake bites. The tender fruits are reportedly eaten as a vegetable.

References

Brahmam and Saxena (1990), Chopra *et al.* (1956), CSIR (1948–1992), Kumar and Jain (1998), Yoganarasimhan (1996).

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Spathodea campanulata Beauv.

Common names

English: African tulip tree; ***Hindi***: rugtoora; ***Kannada***: lujjekaye, neerukaye, ucche kaayi; ***Tamil***: patadi; ***Telegu***: patade, patadiya.

Description

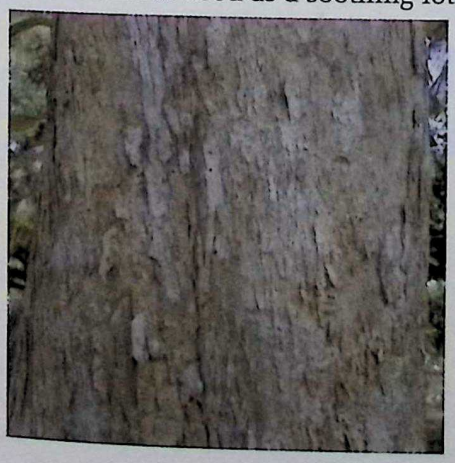
A tall tree up to 22 m tall, branching widely at the top, evergreen except in very dry areas, where it loses its leaves for a few weeks; bark smooth, light brownish-grey. Leaves imparipinnate, 30–45 cm long; leaflets 13–19, elliptical oblong to obovate, 5–9 cm long and 3–4.5 cm wide, base rounded, margins entire, apex acuminate. Flowers large (to 9 cm long and 6 cm broad), bell-shaped, scarlet-red or orange, borne in dense, pendulous, terminal racemes. Fruits (capsules) brownish-black, oblong-lanceolate, 15–23 cm long and 3–5 cm wide, many-seeded; seeds winged all around, 1.7–2.4 cm broad including hyaline wing.

Distribution and habitat

Native to tropical West Africa, but commonly planted in Indian gardens and along roads for its year-round display of flowers. Sometimes planted along riverbanks for erosion control.

Medicinal properties and uses

The dried, pulverized bark or fresh inner bark is used as a dressing for ulcers and other skin troubles. A decoction of the leaves and bark is used as a soothing lotion.



A decoction of the bark is given for treatment of dysentery, gastrointestinal and kidney troubles. An infusion of the leaves is used for treating urethral inflammation.

References

CSIR (1948–1992), Yoganarasimhan (1996).

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Stereospermum chelonoides (L. f.) DC.

Botanical synonyms

Bignonia chelonoides L. f., *B. suaveolens* Roxb., *Stereospermum suaveolens* (Roxb.) A. DC.

Common names

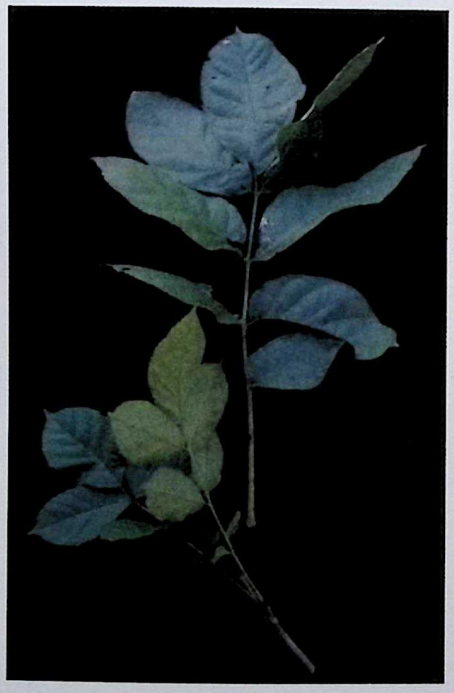
Bengali: ghunta, mug, parul, paruli; ***Hindi***: padal, padaria, padiala, paral; ***Kannada***: billa, giri, hadari, hude,kavi, pudike, vulu-nant-rimarada; ***Malayalam***: kalagari, padal, paroli, pupatri, vedankorana; ***Marathi***: kalagari, padal, padialu, parul, patala; ***Oriya***: baropatuli, padal, parhel, patoli, poridi; ***Punjabi***: kaltham, padal, summe; ***Sanskrit***: patala; ***Tamil***: anbu-vagini, padiri, padri; ***Telegu***: ambuvasini, goddalipulusu, kalagoru, kaligotu, kokkesa, kuberakshi, patali, peddakalaguri.

Description

A medium-sized deciduous tree, usually 9–18 m tall; bark grey or dark brown, horizontally furrowed, exfoliating in large, flat scales. Leaves simple pinnate, 30–60 cm long; leaflets 3–4 pairs plus the terminal one, 7.5–15 cm long and 5–7.5 cm wide, broadly elliptic, apex shortly abruptly acuminate, margins often serrulate when young, rough above, often pubescent beneath, base usually rounded and unequal-sided; main nerves 6–8 pairs; petiolules of lateral leaflets generally less than 2.5 mm long. Flowers sweetly fragrant, borne in large, lax trichotomous viscidly hairy panicles; calyx 1 cm long, campanulate, viscidly hairy, lobes 3–5, short, broad; corolla tubular, campanulate, 2.5–3.8 cm long, dull crimson or purple, yellow within, limb oblique, 2-lipped, lobes rounded, crisped-crenate, the lower 3 lobes longer than the 2 upper. Fruit (capsule) cylindrical, slightly ribbed, usually straight, 30–60 cm long and 1.7 cm in diameter, somewhat rough with elevated whitish specks; valves thick, hard. Seeds pale yellowish-brown, *c.* 3.2 cm long and 1.3 cm wide, with a large, membranous wing at each end. Flowers at the beginning of the dry season after the leaves have been shed.

Distribution and habitat

Native to India and Sri Lanka eastwards to Myanmar (Burma), Laos and Cambodia (Kampuchea). Found throughout most of India in mixed deciduous and sal (*Shorea robusta*)-dominated forests. Common in the sub-Himalayan tract to an altitude of 1500 m. In Rajasthan, Bihar (Chota Nagpur), Madhya Pradesh and many parts



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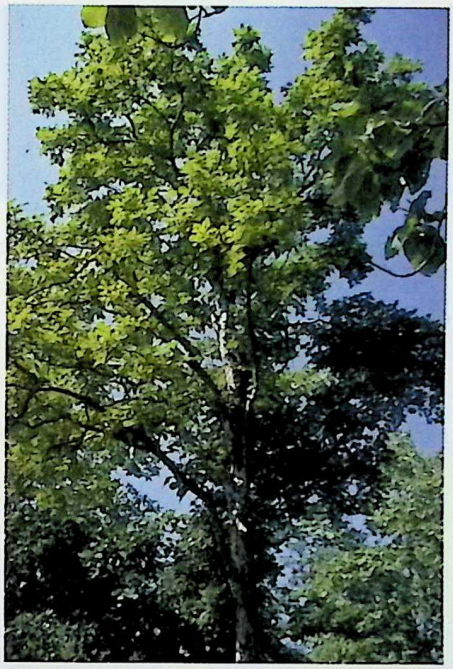
of peninsular India it occurs, often gregariously, on clayey soils, in valleys and on plateaux.

Medicinal properties and uses

In Ayurveda, the root is considered bitter, astringent, cardiotonic, cooling, diuretic and tonic. It is used to treat inflammations, vomiting, asthma, fevers, anasarca, diseases of the blood and distaste. A decoction of the roots is used to treat a variety of conditions, including intermittent and puerperal fevers, inflammatory chest affections, and affections of the brain. The root bark is generally used in combination with other plant drugs; it is an ingredient of the compound Ayurvedic formulations *Dasamularistam, Dhanvantaram tailam, Cyavanaprasam* and *Agastyarasayanam*. Ethanolic extracts of the roots have reportedly shown anti-cancer activity against human epidermal carcinoma of the nasopharynx in tissue-culture studies. Among the Gonds of Uttar Pradesh, a decoction of the root along with the root of *Curcuma longa* (*Zingiberaceae*) and *jaggery* is given for treatment of fever accompanying childbirth; the root extract, along with that of *Sida rhombifolia* (*Malvaceae*), is given orally to clear the uterus after childbirth. The stem bark is considered to have diuretic and tonic properties. In Ayurveda the flowers are considered useful for treating bilious diarrhoea and burning sensations, and the fruits are used to treat leprosy and strangury. They are given along with honey to control hiccups and are sometimes eaten in the form of a confection as an aphrodisiac in Tamilnadu.



References

Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Singh and Prakash (1994), Sivarajan and Balachandran (1994), Yoganarasimhan (1996).

Stereospermum colais (Dillwyn) Mabb.

Botanical synonyms

Bignonia colais Buch.-Ham. ex Dillwyn., *Stereospermum chelonoides* auct. non (L. f.) DC., *S. personatum* (Hassk.) Chatterjee, *S. tetragonum* DC.

Common names

Bengali: atcapali, dharmara, paruli; ***English***: trumpet-flower, yellow snaketree; ***Gujarati***: padeli, patta; ***Hindi***: pader, padri, para, parral; ***Kannada***: bondh-vala, kaalaadri, kalludi, pathiri, vaadari; ***Konkani***: padal; ***Malayalam***: kouringoura, padiri, pimbathiri, puppatiri; ***Marathi***: kirsel, koosga, padal, padoli, parul, padhri, padvale, tuatuka; ***Oriya***: pamphunia, patoli, patuli; ***Sanskrit***: patala, patoli; ***Tamil***: ambuvagini, kural, padiri, pathiri, pombathiri, pompadiri, vellaippadri, velapadri; ***Telegu***: kalagora, kaligottu, kapagargu, magavepa, pisul, pisulu, tagada.

Description

A medium-sized, straight-stemmed, deciduous tree 9–18 m tall with spreading branches; bark fairly smooth, thick, yellow-

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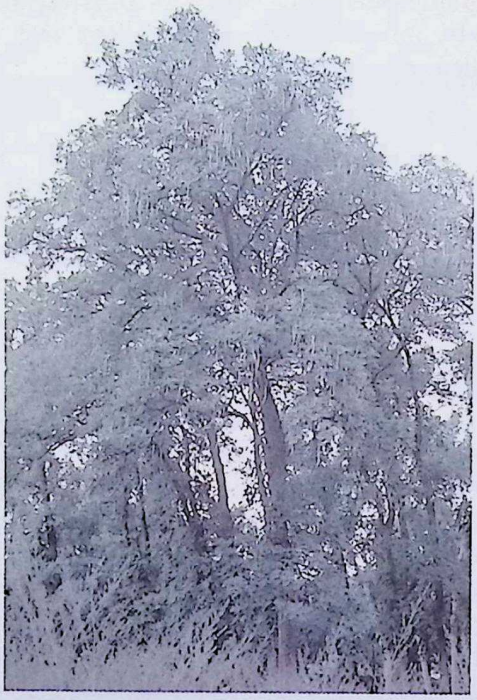

ish-grey. Leaves simple pinnate, 30–45 cm long; leaflets 3–5 pairs plus the terminal one, 10–12.5 cm long and 2.5–5 cm wide, elliptic-oblong or obovate to lanceolate, acute to long caudate-acuminate at apex, base acute or rounded, often unequal-sided, margins entire or shortly serrate; main nerves 8–10 pairs; petiolules of lateral leaflets usually 1–1.3 cm long. Leaves and inflorescences nearly or quite glabrous. Flowers fragrant, borne in slender, lax, drooping terminal panicles; calyx 6 mm long, campanulate, usually purple, shortly 3–5-toothed; corolla 2 cm long, yellow with reddish-purple veins, 2-lipped, lobes of the limb rounded, crisped. Fruits (capsules) slender, curved, pointed, more or less spirally twisted, sub-cylindrical and slightly 4-angled, 30–60 cm long and 1.3 cm wide, glabrous, brown, often covered with raised white specks; seeds winged, wedge-shaped, 2.5–3.2 cm long, splitting along the transverse furrow. Flowers at the beginning of the dry season after the leaves have been shed.

Distribution and habitat

Native to India and Sri Lanka eastwards to Myanmar (Burma), Indochina, southern China, Thailand and, rarely, peninsular Malaysia and Singapore. Found throughout most of India to an altitude of about 1200 m, chiefly in deciduous forests.

Medicinal properties and uses

In Ayurveda, the root, flowers and fruit are considered to have the same properties and uses as those of *Stereospermum chelonoides*. The fresh root bark is juicy and bitter; its decoction is considered useful for treating asthma and relieving cough and excessive thirst. Along with the flowers

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and sugar, the root bark is used to prepare a cooling drink. A decoction of the leaves is reportedly used for treating chronic dyspepsia. Both decoctions are also credited with antipyretic properties. The juice of the leaves, mixed with lime, is used as a sedative. Boiled with oil, the juice of the leaves is used to treat rheumatism and diseases of the ears and teeth. The flowers and fruit are reportedly used to relieve scorpion stings.

References

Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Sivarajan and Balachandran (1994), Yoganarasimhan (1996).

Tecoma stans (L.) H.B.K.

Botanical synonyms

Bignonia stans L., *Stenolobium stans* Seem.

Common names

Kannada: koranekalar; ***Tamil***: nagasambagam, sonnapatti, sornapatti; ***Telegu***: pachagotla.

Description

An erect shrub or small tree up to 4 m tall. Leaves opposite, imparipinnate, up to 20 cm long; leaflets usually 5 or 7, lanceolate to oblong-lanceolate, 6–13 cm long, long-acuminate at apex, base acute or acuminate, margins sharply serrate. Flowers fragrant, borne in terminal panicles; calyx green, 5 mm long, 5-toothed; corolla yellow, 4–4.5 cm long, tube inflated upward. Fruits (capsules) linear, 12–20 cm long and 7–8 mm wide, acuminate, compressed; seeds numerous, each with two thin wings. Flowers and fruits throughout the year.

Distribution and habitat

Native to tropical South America and planted as a hedge plant in gardens throughout India to an altitude of 1500 m and elsewhere in the tropics. Often naturalized on open, degraded sites.

Medicinal properties and uses

The root is reported to be a powerful diuretic, vermifuge and tonic. Ground with lemon juice it is reportedly used as an external application and also taken internally in small quantities as a remedy for snake and rat bites and for scorpion sting.

References

Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

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Bixaceae

Bixa orellana L.

Common names

Bengali: latkan, watkan; ***English***: annatto, lipstick tree; ***Gujarati***: sindhuri; ***Hindi***: latkan, lotpan, senduria; ***Kannada***: kappumankala, rengamali, rangmale; ***Konkani***: kesri; ***Malayalam***: kuppamanjal; ***Marathi***: kesari, sendri, shendri; ***Oriya***: gulbas, japhoran, sakta; ***Sanskrit***: sinduri; ***Tamil***: jafframaram, japhara, kurungu-manjal; ***Telegu***: jaffrachettu, jafra, japhara.

Description

A shrub or small evergreen tree 2–6 m tall with brown, more or less smooth bark. Leaves glabrous, ovate, 7–25 cm long and 4–18 cm wide, base subcordate, apex acuminate, scaly on both surfaces when young, petioles slender, 4–12 cm long. Flowers pink or white, fragrant, borne in terminal panicles. Capsules red or green in colour, 3.8 cm long, ovoid or subglobose, softly prickly, containing approximately 50 trigonous seeds with a red, pulpy covering. Flowers between August and September in central India.

Distribution and habitat

Indigenous to tropical America, cultivated and naturalized locally throughout tropical and subtropical India for the red dye obtained from the pulp surrounding the seeds (*annatto*).

Medicinal properties and uses

The pulp surrounding the seeds is widely used for medicinal purposes as a haemostatic, antidysenteric, diuretic, laxative, febrifuge and digestive. It is also prescribed for the treatment of epilepsy, kidney and skin diseases. The fresh pulp is applied to

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burns to prevent blisters and scars. *Annatto* is considered an effective antidote to poisoning by bitter cassava (*Manihot esculenta*: *Euphorbiaceae*) and physic nut (*Jatropha curcas*: *Euphorbiaceae*). The seeds are astringent, febrifuge and used to treat gonorrhoea; the seed oil is reportedly used to treat leprosy. A decoction of the leaves is used as a gargle for sore throat, while an infusion is given in cases of jaundice and dysentery. The leaves are also a popular febrifuge and are reported to possess anti-tumour properties. A poultice of the leaves is applied to cuts and gashes as a scar preventative. The pounded leaves, macerated in water, release a gummy substance that is diuretic and prescribed in cases of gonorrhoea. The twigs are used to treat liver disorders as an emollient. The root bark is reportedly antiperiodic and is used in the treatment of fevers.

References

Asolkar *et al.* (1992), Chatterjee and Pakrashi (1992), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935).

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Bombacaceae

Bombax ceiba L.

Botanical synonyms

Bombax heptaphyllum Roxb., *B. malabaricum* DC., *Gossampinus malabarica* (DC.) Merrill, *Salmalia malabarica* (DC.) Schott & Endl.

Common names

Bengali: pagun, roktosimul, simul; ***English***: Indian bombax, red cotton tree, silkcotton tree; ***Gujarati***: sawar, shimalo; ***Hindi***: kaantisenbal, pagun, rakatsenbal, semal, simal, simul; ***Kannada***: booruga, burla, kempabooruga, mullelava, mullu-booruga, sauri; ***Konkani***: sanvor, sauvor; ***Malayalam***: ilavu, mocha, mullilabpoola, mullilavau; ***Marathi***: kantesavar, saur, sayar, sayarsimalo; ***Oriya***: boroh, nouroh; ***Sanskrit***: moca, mocha, salmali; ***Tamil***: ilavu, illavam, mullilavau, pulai, purani; ***Telegu***: boorugachettu, buraga, burgha, kondabooruga-chettu, mundlabooruga-chettu, salmali.

Description

A deciduous tree with a straight, buttressed trunk, up to 40 m tall and 6 m or more in girth, with horizontally spreading branches, more or less in whorls; young stems covered with stout, hard prickles. Bark pale ash to silver-grey, smooth in the early years, later becoming rough with irregular vertical cracks. Leaves large,

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spreading, glabrous, palmately compound, leaflets 5–7, lanceolate, 10–20 cm long, arranged spirally on twigs. Flowers numerous, large, 10–13 cm in diameter, fleshy, bright crimson, yellow or orange, clustered at the end of branches. Capsules oblong-ovoid, woody, 10–19 cm long; seeds many, obovoid, smooth, 6–9 mm long, oily, with dense silk hairs. Flowers between January and March; fruits mature from March to May. In central India, trees remain leafless between December and June.

Distribution and habitat

Native to Pakistan and India eastwards to Myanmar (Burma), Indochina, Taiwan, Thailand, Java, Borneo, the Philippines, Sulawasi, the Lesser Sunda Islands, the Moluccas, New Guinea and northern Australia. Widely distributed throughout tropical and subtropical India up to 1500 m elevation. In peninsular India, the tree is very common in the dry as well as moist deciduous forests, often near rivers and forest edges or in disturbed forests. The tree is a strong light-demander, fast-growing, and grows best on deep sandy loams or other well-drained soils, particularly in valleys, in regions receiving from 50 to 460 cm annual rainfall well-distributed throughout the year.

Medicinal properties and uses

The flowers are astringent and cooling. A paste of the flowers, and also of the leaves, is applied externally to relieve swellings, boils and various skin troubles. The young fruits are reportedly used as an expectorant, stimulant and diuretic and are considered beneficial in the treatment of calculous affections, chronic inflammation and ulceration of the bladder and kidneys. The seeds are used in the treatment of gonorrhoea, chronic cystitis and catarrhal affections. Among the tribal inhabitants of Udaipur District in Rajasthan, a paste of the seeds is used as a local application to relieve smallpox and chickenpox. The stem bark is mucilaginous and its infusion is given as a demulcent, emetic and tonic, and its aqueous extract mixed with yoghurt is used to treat dysentery. Externally it is used as a styptic, and also for fomenting wounds. A paste of the bark is applied to skin eruptions and, among the tribal inhabitants of southern Bihar, to the forehead to relieve giddiness. The gum exuded from the bark is edible and considered to have astringent, tonic and demulcent properties; it is used as an aphrodosiac and to treat diarrhoea,

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dysentery, menorrhagia, influenza, and haemoptysis in cases of pulmonary tuberculosis. Mixed with dried mango seeds and honey, the gum is taken internally to relieve painful menstruation among the Kondhs in southwestern Orissa. A paste prepared from the root, and the sap from the stem, is reportedly taken internally to treat leucorrhoea in southern West Bengal. The young taproot is reported to possess astringent, stimulant, tonic, aphrodisiac, emetic and demulcent properties; it is used to treat dysentery. In the Gandhamardan Hills of Orissa, the roots of the young plant are ground with those of *Pueraria tuberosa* (*Fabaceae-Papilionoideae*) and *Asparagus racemosus* (*Asparagaceae*) and given with cow's milk as a remedy for spermatorrhoea. The silky hairs surrounding the seeds are known as *kapok*, an important commercial product used for filling mattresses and (waterproof) life-jackets, and as an insulating material. The tender young leaves, young roots, flower buds and fleshy calyces are edible and sometimes used as a vegetable.

References

Asolkar *et al.* (1992), Brahmam and Saxena (1990), Chopra *et al.* (1956), CSIR (1948–1992), Ghosh and Sensarma (1997), Girach and Aminuddin (1995), Jain *et al.* (1989), Katewa and Arora (1997), Kirtikar *et al.* (1935), Mukherjee and Namhata (1990).

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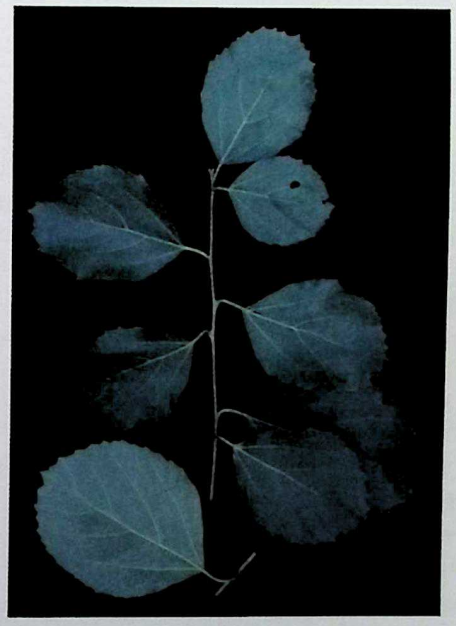
Boraginaceae

Cordia dichotoma Forst. f.

Botanical synonyms

Cordia brownii DC., *C. indica* Lam., *C. ixiocarpa* F. Muell., *C. lowriana* Brandis, *C. suaveolens* Blume, *Varronia sinensis* Lour.



Common names

Bengali: bahubara, bohari, bohodari, buhul, lashora; ***English***: clammy cherry, Indian cherry, sebesten plum; ***Gujarati***: barghand, gundi, gundo, vadgunda; ***Hindi***: bhokar, chhotalasora, gondi, guslasah, lasora, rassala; ***Kannada***: challangayi, challe, chella, chikkachalle, salle; ***Konkani***: nilti; ***Malayalam***: ari, cheruviri, viriyasam, virusham; ***Marathi***: bhokar, chokri, sherti, shelu, shelvant; ***Oriya***: ambata, duanl, gondi, guhalo; ***Punjabi***: lasura; ***Sanskrit***: bahuvaraka, bukampadaruka, selu, slesmataka; ***Tamil***: kalvirusu, naruvili, vidi, viriyan, viruvu; ***Telegu***: botuka, chinna, inki, iriki, nakheri, nakkeru; ***Urdu***: lasora.

Description

A medium-sized evergreen tree up to about 14 m tall with a crooked stem and smooth greyish bark. Leaves alternate, borne on short spurs, variable in form and size, from elliptic-lanceolate to broadly ovate, 5–10 cm long and 2.5–6 cm wide, apex obtuse to acute, base obtuse to rounded, margins entire or crenate; petioles slender, 1.3–3.4 cm long. Flowers dull white, borne in many-flowered, lax terminal axillary cymes 3.5–13 cm long and 3–10 cm broad; peduncles 2.5–5 cm long; buds nearly globose. Fruits (drupes) 1.3–2.5 cm long, globose or ovoid, glossy, yellowish-brown, pinkish or nearly black when ripe, usually containing a single seed surrounded by a transparent, sticky, sweet edible pulp. Flowers mainly from March to April and fruits from May to June.

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Distribution and habitat

Occurs naturally from Pakistan to southern India and Sri Lanka eastwards through tropical Asia and Malaysia to Queensland and New Caledonia. Common in semi-deciduous forests throughout India to an elevation of about 1000 m. Often planted.

Medicinal properties and uses

In Ayurveda, the fruits are considered anthelmintic and bechic; they are used as an expectorant and astringent and considered useful for treating all diseases of the lungs. In Unani medicine they are considered anthelmintic, diuretic, expectorant, purgative, maturant and vulnerary, and are used to treat dry cough, diseases of the chest and urethra, in biliousness and chronic fever, joint pains and diseases of the spleen. The fruit juice is taken orally as a 'blood-purifier' among the inhabitants of Bhadrak District in Orissa. The powdered seed kernel, mixed with oil, is applied externally to treat ringworm. The leaves are applied externally to relieve ulcers and headache. The powdered bark is used as an external application for treating prurigo among the Santhalis. The juice expressed from the bark is mixed with coconut milk to relieve griping, and a decoction of the bark is considered useful for the relief of dyspepsia and fevers.

References

Asolkar *et al.* (1992), Chatterjee and Pakrashi (1995), Chopra *et al.* (1956), Girach *et al.* (1997), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

Cordia macleodii Hook. f. & Thoms.

Common names

Hindi: dahipalas, dhagan, dhaiman, dhengan; ***Kannada***: bilichalle, doddachalle, hadang, hirichalle; ***Marathi***: bhoti, dahipalas, daiwas, dhaiwan; ***Oriya***: baurlo, bhoto, bohurolo; ***Tamil***: palandekku; ***Telegu***: botuku, peddabattuva, peddabotuku.

Description

A small to medium-sized, evergreen tree up to 12 m tall with smooth whitish or greyish bark; branchlets, undersides of leaves, and inflorescence clothed with dense grey or tawny tomentum. Leaves alternate or subopposite, 5–20 cm long and

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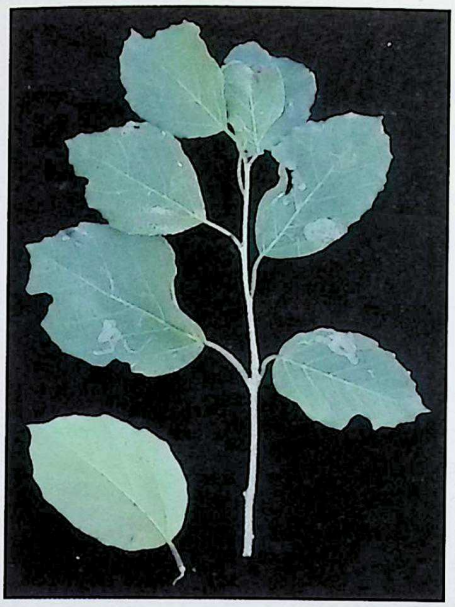

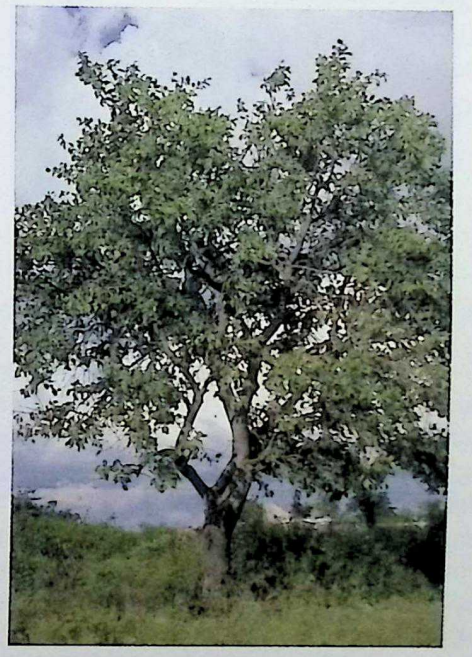

nearly as wide, ovate, apex obtuse, 3–5-nerved at the base, upper surface rough but shiny, lower surface densely clothed with grey or tawny tomentum; basal and secondary and transverse tertiary nerves prominent; petioles 2.5–5 cm long. Flowers polygamous, white, borne in dense, nearly sessile, lateral or terminal cymes; calyx 8 mm long, densely tomentose, ribbed, lobes short, obtuse; corolla 1.6 cm long, lobes *c.* 8 mm long and 2.5–3 mm wide, exceeding the tube, spathulate-oblong, obtuse, veined. Fruits (drupes) 1.3–2 cm long, globose to ovoid, acute, supported on the cup-shaped, ribbed, tomentose persistent, crenate or denticulate calyx, yellowish when ripe, inedible. Flowers from March to April and fruits from May to June in central India.

Distribution and habitat

Found mainly in moist and dry deciduous forests up to 1200 m in peninsular India from Chota Nagpur (Bihar) southwards to Tamilnadu.

Medicinal properties and uses

The bark is used by the Santhalis to treat jaundice.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

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Ehretia laevis Roxb.

Botanical synonyms

Ehretia aspera Willd., *E. floribunda* Benth., *E. obtusifolia* Hochst.

Common names

Bengali: tamboli; ***Gujarati***: charmol, darar, datrango, koda, vadhavardi, vedhaya-yato; ***Hindi***: chamror, darar, datranga, koda; ***Kannada***: adak, bagari, kappura; ***Malayalam***: chavandi; ***Marathi***: kupta, datrang, datrangi; ***Oriya***: guachipo, mosonea, tambalu; ***Punjabi***: sakar; ***Tamil***: addi, addula, kalyirussu, narivalli; ***Telegu***: paldatam, peddapulmera, pogadi, pogadichellu, pokachettu.

Description

A deciduous shrub or a small tree up to 12 m tall with an irregular trunk; bark light grey or whitish. Leaves alternate, variable in size and shape, 2–6.3 cm long and 1.3–3.8 cm wide, elliptic-oblong or obovate, margins entire, apex rounded or shortly acuminate, sometimes retuse, scabrous, slightly hairy or glabrous above, persistently hairy beneath; petioles 0.6–2 cm long. Flowers white, borne in paniculate cymes that are at first corymbose and apparently terminal, becoming lax and lateral; calyx 2.5 mm long, 3-lobed; corolla 6–8 mm long, 5-lobed, tube and lobes longer than the calyx. Fruit (drupe) depressed-globose, *c.* 6 mm in diameter, orange-red when ripe; pyrenes usually 4, bony.

Distribution and habitat

Native to tropical and subtropical Asia from Iran to Indochina and Australia. Common in deciduous and monsoonal forests to an elevation of about 1000 m throughout most of peninsular India and in the Andaman Islands.

Medicinal properties and uses

A decoction of the fresh root is used to treat syphilis among the Santhalis. Among the tribal inhabitants of Prakasam District in southern Andhra Pradesh, a decoction of the stem bark is used to treat diphtheria, the tender leaves are made into a paste used externally to treat eczema, and the dried powdered flowers taken with milk are used as an aphrodisiac.

References

Asolkar *et al.* (1992), CSIR (1948–1992), Jain and Tarafder (1970), Kirtikar *et al.* (1935), Vijaya Kumar and Pullaiah (1998).

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Trichodesma indicum L.

Botanical synonyms

Borago indica L., *Trichodesma sedgewickianum* Bannerjee nom. nov.

Common names

Bengali: chhotokalpa, chotokulpa; ***Gujarati***: undhaphuli; ***Hindi***: andhahuli, chhotokalpa, chhotakulpha, hetamundiya, ondhaphuli, ratmandi; ***Kannada***: adhomukhi, kattethumbesoppu; ***Marathi***: chhotaphulya, lahanakalpa, pathari; ***Oriya***: hetamundia; ***Punjabi***: andusi, kallributi, nilakrai, ratmandu; ***Sanskrit***: adhakpuspi, adhapushpi, surasa; ***Tamil***: kalhudaitumbai, kazhuthaithumbai; ***Telegu***: guvvagutti.

Description

A wiry, hispid, erect or diffuse annual herb 15–45 cm high. Leaves opposite, very variable in size and shape, usually sessile, 2.5–10 cm long and 0.6–5 cm wide, spathulate to auriculate, apex acute, base cordate, margins entire, upper surface clothed with stiff hair arising from circular tubercles, lower surface more or less densely villous. Flowers pale blue, changing to pink or white, solitary and leaf-opposed and in terminal few-flowered cymes; pedicels 0.6–1.3 cm long, slender, hispid; calyx 1.1–1.3 cm long (including auricles), deeply divided, hispid with long hairs, segments (lobes) lanceolate, acute, cordate or hastate at base, connate by the basal auricles; corolla 1.3 cm long, tube 6 mm long, limb oblique, thinly hairy inside. Fruit pyramidal, 4-ribbed, enclosed in an enlarged calyx; nutlets 4, 15 mm long, ovoid, smooth and polished on the back, rugose on the inner face, bluish-white or nearly white when ripe. Flowers and fruits between July and January.

Distribution and habitat

Native to the Indian subcontinent, Myanmar (Burma), the Philippines and Mauritius. Found as a weed in disturbed open habitats throughout most of India to an altitude of about 1500 m in the Himalayas, typically on roadsides, in cultivated fields, on dry stony wasteland, and on black cotton soil in peninsular India.

Medicinal properties and uses

The herb is considered to have diuretic properties in Unani medicine; it is also used for making emollient poultices. In Ayurvedic practice the whole plant and root are reportedly used to treat arthritis, anorexia, sprue, dysentery, skin diseases, snake-bite poisoning and fever. A cold infusion of the leaves is considered depurative. The root, pounded and made into a paste, is applied externally to relieve swollen joints and to superficial skin injuries. The pounded root mixed with water, or its decoction, is given to children to relieve dysentery. The flowers are reportedly used as a sudorific and pectoral. Both the leaves and flowers are edible.

References

Chatterjee and Pakrashi (1995), Chopra *et al.* (1956), CSIR (1948–1992), Girach (1992), Upadhye *et al.* (1994), Yoganarasimhan (1996).

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Trichodesma zeylanicum (Burm. f.) R. Br.

Botanical synonym

Borago zeylanicum Burm. f.

Common names

Bengali: barakalpa; ***Hindi***: dhadhona, hetenuria, jalasirasa, jhingi; ***Marathi***: jalashirasi; ***Sanskrit***: goksura, gokshura, svadamstra, trikantaka.

Description

A stout, coarse, wiry, erect or diffuse, hispid, annual herb, usually 30–60 cm high; stems densely pilose, often purple. Leaves opposite, lanceolate to oblanceolate, 5–10 cm long and 1.3–2.5 cm wide, apex acute or subobtuse, margins entire, base acute, upper surface covered with stout, stiff, bulbous-based hairs, finely pubescent on veins beneath; upper leaves sessile or very short-petioled, lower leaves with petioles 4–13 mm long. Flowers pale blue, numerous, borne solitary and axillary or in irregular, nodding racemose 5–10-flowered, terminal paniculate cymes with long, drooping pedicels; calyx lobes divided nearly to the base, appressed-hairy, rounded at base, segments 8 mm long, lanceolate, acute, with a strong midrib; corolla tube 5 mm long, campanulate, lobes *c.* 1.5 mm long, obovate, triangular, apex rounded with a sudden spirally twisted tip 2.5 mm long. Fruits ellipsoid, nutlets ovoid-oblong, smooth, obscurely margined, 4–5 mm long, grey-brown when ripe. Flowers and fruits almost year-round.

Distribution and habitat

Native to India, the Mascarene Islands, Malaysia and Australia. Found in drier habitats and wastelands throughout peninsular India from Gujarat and Madhya Pradesh southwards, and in southern localities of West Bengal.

Medicinal properties and uses

In Ayurveda the plant is considered alexipharmic and is used to treat leucoderma and piles. The leaves are credited with emollient, demulcent and diuretic properties and are used to prepare emollient poultices. The powdered root is applied to wounds to relieve pain. The flowers are reportedly used in the Philippines as a sudorific and pectoral.

References

Chatterjee and Pakrashi (1995), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

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Brassicaceae

Lepidium sativum L.

Common names

Bengali: aleveri, halim; ***English***: garden cress; ***Gujarati***: asalio, halim; ***Hindi***: halim, hurf; ***Kannada***: allibija, kurutige; ***Marathi***: ahliva; ***Punjabi***: halim, shargundei, tezak; ***Sanskrit***: candrasura, chandrashura; ***Tamil***: aliverai; ***Telegu***: adalavitulu, adeli, adityalu; ***Urdu***: halim.

Description

A small, herbaceous, glabrous annual, 15–45 cm tall. Leaves variable, entire or variously lobed or pinnatisect, often with linear segments; lower leaves long-petioled, twice pinnatisect; upper leaves sessile, linear, linear-oblong or pinnatifid. Flowers small, white, in long racemes. Fruits (pods) small, orbicular-ovate, notched at the apex, winged; seeds solitary in each cell.

Distribution and habitat

Considered to have originated in the highland region of Ethiopia and Eritrea, later introduced to Europe and western Asia. It is cultivated as a salad plant throughout India, sometimes naturalized.

Medicinal properties and uses

The plant is used in the treatment of asthma, coughs and bleeding piles. The leaves are mildly stimulant and diuretic, and are useful for treating scorbutic diseases and liver disorders. The root is used in secondary syphilis and tenesmus. The seeds are rubefacient, galactagogue, emmenagogue, laxative, tonic, aphrodisiac and diuretic; they are used in poultices to treat sprains. A mucilage obtained from the seeds soothes irritation of the intestines in cases of dysentery and diarrhoea. In Ayurveda the plant is considered tonic, galactagogue and aphrodisiac, and useful for treating dysentery, abdominal pain,

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blood and skin diseases and tumours; its fruits are recommended for treating skin and eye diseases. In Unani, the seeds are used to treat inflammation and ailments of the spleen, bronchitis, rheumatism and muscular pain, and are believed to improve brain power and brighten the intellect.

References

Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

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Burseraceae

Boswellia serrata Roxb. ex Colebr.

Botanical synonyms

Boswellia glabra Roxb., *B. serrata* Roxb. var. *glabra* (Roxb.) Bennet, *B. thurifera* Roxb.

Common names

Bengali: kundur, luban, salai; ***English***: Indian frankincense tree, Indian olibanum tree; ***Gujarati***: dhup, gugali; ***Hindi***: kundur, luban, salai; ***Kannada***: chitta, guguladhupa, madimara; ***Malayalam***: kunturukkam, mukundam, palankam, parangi-saambraani; ***Marathi***: sallai, salphullie; ***Oriya***: loban; ***Punjabi***: salhi; ***Sanskrit***: kunduru, sallaki, susrava; ***Tamil***: kundurukkan, kungiliyam, muraiyidam, parangichambrani, vellaikkungiliyam; ***Telegu***: anduga, dhupamu, guggilamu, parangisambrani, phirangi-saambraani, tellaguggilamu; ***Urdu***: kundur, lobana.

Description

A medium- to large-sized, deciduous tree, up to 18 m tall; bark ash-coloured, smooth, peeling off in thin, papery flakes, resinous inside; young shoots and leaves pubescent. Leaves alternate, imparipinnate, 20–45 cm long; leaflets 8–15 pairs plus a terminal leaflet, 2.5–6.3 cm long and 1.2–3 cm wide (the lowest pair often much smaller than the others), sessile, variable in shape, ovate or ovate-lanceolate, apex usually obtuse, base acute, rounded or somewhat truncate, margins crenate-serrate. Flowers small, white, in axillary racemes or panicles shorter than the leaves; calyx pubescent outside, lobes broadly triangular-ovate; petals 5 mm long, ovate, pubescent outside, tips inflexed. Fruits (drupes) *c.* 12 mm long, trigonous, splitting along 3 valves; pyrenes compressed, hard, winged. Two varieties are usually distinguished: var. *serrata* having pubescent leaves with crenate-serrate margins (pictured here), and var. *glabra* which has entire, glabrous

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leaves with entire margins. In central Indian deciduous forests, flowering occurs between February and April and fruiting from April to May; trees usually leafless between December–January and June.

Distribution and habitat

Commonly found in the dry forests in the foothills of the Western Himalayas, and from Rajasthan to Bihar southwards through central India to Andhra Pradesh. It is very common in the dry, rocky hills of central and western India in association with *Sterculia urens* (*Sterculiaceae*), *Odina wodier* (*Anacardiaceae*) and *Cochlospermum gossypium* (*Cochlospermaceae*). The tree is usually gregarious, and in some forests the tree forms almost pure stands.

Medicinal properties and uses

The gum exuded from the cut bark, a fragrant, golden-yellow oleo-gum-resin known as *Indian olibanum*, *Indian frankincense* or *salai-guggal*, is chiefly used as incense, but is also credited with astringent, stimulant, expectorant, diuretic, diaphoretic, emmenagogue, ecbolic and antiseptic properties. It is reportedly useful in the treatment of ulcers, tumours, goitre, breast cysts, diarrhoea and dysentery, piles and skin diseases. It is also used in the preparation of an ointment for sores, and with butter for treatment of syphilis. The non-phenolic fraction of the oleo-gum-resin possesses anti-tumour, sedative and analgesic activity. The bark is thought to be useful in the treatment of diarrhoea, piles, skin diseases, ulcers and coughs. Among the Gonds of Utttar Pradesh, the stem bark is chewed to relieve toothache and to check pus formation in the mouth; a lukewarm paste of the bark is applied externally to relieve eye inflammations. Among the tribal inhabitants of Prakasam District in southern Andhra Pradesh, a decoction of the stem bark is taken to treat dysuria, and a paste of the dried, ground bark is applied to the forehead to relieve headache. Pounded together with turmeric in kerosene, it is applied to relieve traumatic pain among the tribal inhabitants of southern Bihar. In folk medicine the powdered flowers are used to treat colds and fevers. The tree also yields a valuable timber.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Girach and Aminuddin (1995), Singh and Prakash (1994), Vijaya Kumar and Pullaiah (1998).

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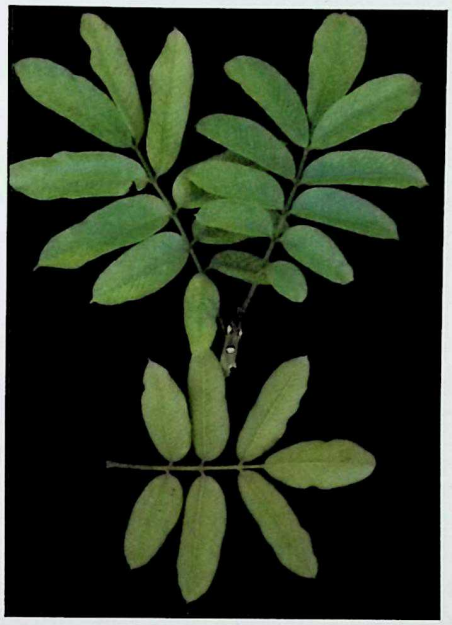
Canarium strictum Roxb.



Botanical synonyms

Canarium resiniferum Brace ex King, *C. sikkimense* King

Common names

Bengali: kala dammar; ***English***: black dammar-tree; ***Gujarati***: kala dammar; ***Hindi***: kala dammar; ***Kannada***: hale-maddu, karedupa, mandadupa, pandu, raladupa; ***Malayalam***: karutha-kungiliyam telli, karuttukungiliyam, kunthirikka payin, thalli; ***Marathi***: dhup, raldhup; ***Sanskrit***: mandadhupa, raladhupa; ***Tamil***: karang kunthrikam, karupa kangiliam, karapukongiliam, karupa-damar, kurangukunthirikam; ***Telegu***: nallarojanamu (resin).

Description

A very tall, handsome, evergreen, buttressed tree, up to 50 m tall with a straight, white, cylindrical stem; bark hard, light greenish-grey, thin, rough, somewhat aromatic, exfoliating, yielding a black resin when cut. Both the twigs and leaflet undersurfaces are covered with reddish hairs. The young foliage is bright yellow, later turning crimson. Leaves alternate, large, 0.6–1.2 m long, imparipinnate; leaflets 7–15, opposite or alternate, ovate-oblong, ovate-lanceolate or unequal-sided, 10–20 cm long and 4–10 cm wide, apex acuminate, margins finely serrate, lateral nerves 10–15 pairs, very prominent beneath; petiolules 2.5–8 mm long. Flowers small, white or bright yellow, faintly fragrant in terminal or axillary panicles shorter than the leaves, male and female flowers separate; pedicels very short; calyx usually 4-lobed, cupular, rusty tomentose outside, tube 3 mm long, lobes triangular, 1 mm long; petals 6 mm long and 2 mm broad, oblong-obovate, apex rounded. Fruits (drupes) ellipsoid or obovoid, 3.8–5 cm long, resinous with a hard stone. Flowers from January to March and fruits ripen between November and January.

Distribution and habitat

Found in moist evergreen forests of eastern India, on the west coast in Karnataka and Kerala, and in Tamilnadu, up to an altitude of 1600 m in the Western Ghats, and in the Andaman Islands. Sometimes planted for shade in coffee plantations in Karnataka.

Medicinal properties and uses

The cut bark yields an aromatic resin, known commercially as *black dammar*, used as an incense and illuminant. Mixed with fish oil, it is used for caulking boats and preserving fishing lines; dissolved in turpentine, it makes a good, dark-coloured varnish. The resin also possesses some medicinal properties. It is used in treating chronic skin diseases such as psoriasis and pityriasis. As a liniment with sesame oil it is used to soothe rheumatic pains. As a decoction or in powdered form, the resin is used to treat rheumatism, fever, cough, epilepsy and asthma.

References

Chopra *et al.* (1956, 1969), CSIR (1948–1992), Yoganarasimhan (1996).

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Commiphora caudata (Wight & Arn.) Engl.

Botanical synonym

Protium caudatum Wight & Arn.

Common names

English: hill mango; ***Kannada***: konda mavu; ***Tamil***: kiluvai; ***Telegu***: konda mamidi.

Description

An unarmed deciduous shrub or small tree with papery bark. Leaves compound; leaflets usually 3–5, ovate or elliptic, glabrous, apex acute or typically acuminate, margins entire, up to 5 cm long and 3 cm wide, terminal leaflet long-petioled. The small flowers are borne in a long-peduncled paniculate dichasium up to 10 cm long; calyx glabrous, petals brownish-red, 0.5 cm long. The fruit is a subglobose drupe 1.2 cm in diameter. Flowers and fruits from February to October.

Distribution and habitat

Common in dry deciduous and scrub forests of interior Karnataka, Andhra Pradesh and Tamilnadu.

Medicinal properties and uses

The bark and leaves yield a gum-resin that is reportedly used medicinally in southern India. An extract of the stem bark has been found to possess antiviral properties.

Reference

Asolkar *et al.* (1992).

Garuga pinnata Roxb.

Common names

Bengali: dabdabe, nil bhadi, tum karphat; ***Gujarati***: kakad, khusimb; ***Hindi***: ghogar, kaikar, kenkar, kharpat, kharput, tum; ***Kannada***: aranelli, bilagadde, doddadumpli, hallubolige, nelligadde; ***Konkani***: halabalage, kadad, kusimba; ***Malayalam***: karuvempu, kareyam, kattukalinjan; ***Marathi***: kakad, karuk, kudak; ***Oriya***: handulomohi, kikodu, mohi, sompotri; ***Sanskrit***: golika, karnikara, kinkirata, krsnamilka, paranki; ***Tamil***: karrevemba, karuvembu; ***Telegu***: gargu, garuga, kondavepa.

Description

A medium-sized deciduous tree; bark thick, soft, grey or brown outside and red

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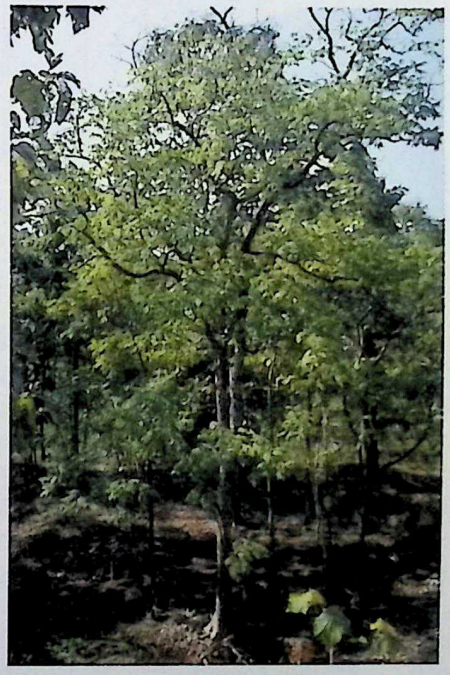
within, peeling off in irregular flakes. Leaves alternate, imparipinnate, 15–45 cm long, clustered at the ends of branches; leaflets 5–10 pairs plus a terminal one, opposite, 5–15 cm long and 2–5 cm wide, lanceolate or ovate-lanceolate, apex usually acuminate, base oblique, margins crenate to serrate, pubescent when young. Flowers small, yellow, bell-shaped, borne in much-branched terminal clusters, several together at the ends of branches; bracts deciduous; calyx 6 mm long, campanulate, downy tomentose outside, lobes ovate-oblong, subobtuse; petals 5 mm long, linear-oblong, tomentose outside, attached to the tube of the calyx beneath the margin of the disc. The fruit is a fleshy, smooth, globose, edible, black drupe, approximately 1.8 cm long; pyrenes 1–3, bony; seed with a membranous wing. During the rainy season and into the cool months of October and November, the leaves often turn orange or crimson in colour before falling. Flowers between February and April, and fruits from May to July; trees remain leafless between December–January and June in central Indian deciduous forests.



Distribution and habitat

Throughout India to an elevation of approximately 900 m, most commonly in mixed deciduous forests.

Medicinal properties and uses

The fruit is credited with stomachic properties. The astringent juice of the leaves, mixed with that of *Justicia adhatoda* (*Acanthaceae*) and *Vitex negundo* (*Verbenaceae*) and honey, is used to treat asthma in the Konkan. The boiled bark, made into a paste, is applied externally to promote healing of bone fractures among the Sahariyas of northwestern Madhya Pradesh. The juice from the stem is used as an eyedrop to cure opacities of the conjunctiva.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956), Kirtikar *et al.* (1935), Sikarwar and Kaushik (1992).

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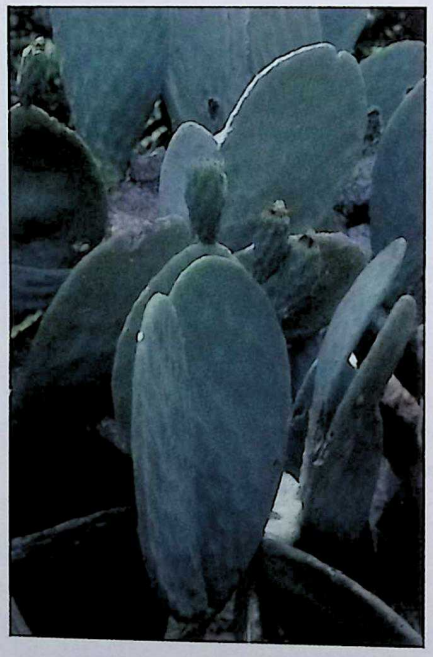
Cactaceae

Opuntia stricta (Haw.) Haw. var. *dillenii* (Ker.-Gawl.) L. Benson

Botanical synonyms

Cactus dillenii Ker.-Gawl., *Opuntia dillenii* (Ker.-Gawl.) Haw.



Common names

Bengali: nagphana, phenimama; ***English***: prickly pear; ***Gujarati***: chorhathalo, zhorhatheylo; ***Hindi***: hathhathoria, nagphana, wathhataria nagphana; ***Kannada***: chappatigalli, dabbugalli, mullugalli, papasakalli, papasukattale; ***Malayalam***: nagamulla, nagatali, palakakkalli; ***Marathi***: chapal, nagaphana, samar; ***Oriya***: nagophenia, nagopheni, poturiyasiju; ***Punjabi***: chhittarthohar; ***Sanskrit***: kanthari, vidara; ***Tamil***: manjarnagadali, mullukkalli, nagadali, nagathali, sappathikalli; ***Telegu***: nagadali, nagajanadu, nagajemudu, nagamullu; ***Urdu***: nagaphani, thuar.

Description

An erect, succulent branching shrub, usually from 2 to 4 m tall. Joints dull bluish-green, flat, obovate, to 22 cm long with many areoles, each bearing 4–6 flattened, usually somewhat curved, yellowish spines. Flowers 8 cm long, with bright yellow petals tinged with red. Fruit (berry) globose or pear-shaped, bearing spines near the apex, fleshy, deep reddish-purple when ripe, edible. In central India, flowering occurs between April and September; fruits ripen in November and December.

Distribution and habitat

Native to the American tropics and subtropics, probably originating in the Californian peninsula of Mexico. Introduced to India during the 18th century. Common in scrub forests, along roads and on degraded lands throughout peninsular India. Often cultivated as a hedge plant.

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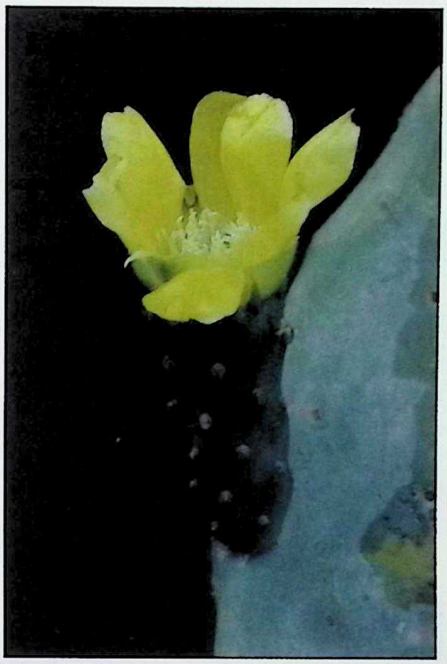
Medicinal properties and uses

The fruit is considered cooling, and useful in the treatment of gonorrhoea. The baked fruit is reportedly used in the treatment of whooping cough. A syrup of the fruit is said to increase the secretion of bile and to control spasmodic cough and expectoration. The mashed joints are used as a poultice to relieve inflammation and the heated joint is applied to boils to hasten suppuration. In the form of a poultice, they are used to promote healing of guinea-worm abscesses. The pulped joint is also reportedly used as an external application for treating ophthalmia. In Siddha, the plant, the joint and the fruit are used to treat poisoning, cough, leucorrhoea and constipation.



References

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Capparidaceae

Cadaba fruticosa (L.) Druce

Botanical synonyms

Cadaba farinosa Forssk., *C. indica* Lam., *Cleome fruiticosa* L., *Stroemia tetandra* Vahl

Common names

English: Indian cadaba; ***Gujarati***: kalokattiyo, khordu; ***Hindi***: dabi, kodhab; ***Kannada***: chegaviche, maragache, shegurti; ***Malayalam***: kattakatti; ***Marathi***: kalitaka, kalitakal; ***Tamil***: kattagatti, vilivi, villi; ***Telegu***: adamorinika, chavukuttivaaku, chemoorda.

Description

An unarmed, straggling, much-branched shrub up to 3 m tall with cylindrical stems, the older smooth, purplish, the younger pubescent, yellowish-brown. Leaves 1.2–3.5 cm long and 0.8–1.8 cm wide, ovate-oblong or ovate, glabrous, margins entire, apex acute or obtuse-mucronate, base rounded, venation well-defined beneath; petioles 0.2–0.4 cm long. Flowers dirty-white, 1.5 cm across, in few-flowered, terminal, 1-sided corymbose inflorescences; pedicels 0.9–1.8 cm long, pubescent; bracts minute, subulate; sepals 8–13 mm long, pubescent, the two outer boat-shaped, the two inner flat, ovate, acute; petals 4, pale yellow, spathulate, equalling the sepals, claws long, slender. Fruits (capsules) linear oblong, cylindrical, 2.5–4 cm long, muricate, glabrous or pubescent, dehiscent, irregularly torulose; seeds black, striate, reniform-rotundate or comma-shaped, compressed, about 2 mm in diameter, embedded in a yellowish-orange or red aril. Flowers between November and March and fruits from January to April in central India.

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Distribution and habitat

Commonly found throughout the drier lowland regions of India and Sri Lanka. Also occurs in Pakistan, the Arabian peninsula and in eastern and northeastern Africa.

Medicinal properties and uses

The leaves and roots are considered deobstruent, anthelmintic and emmenagogue, and are prescribed in the form of a decoction for treating uterine obstructions. The leaves are used as a poultice to promote healing of sores. In Siddha, the leaf and fruit are used to treat worm infestation, swellings, eczema and constipation. A number of other medicinal uses are reported from Senegal, Niger, Sudan, Tanzania and elsewhere in East Africa.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

Capparis sepiaria L.

Botanical synonyms

Capparis glauca Wall. ex Hook. f. & Thoms., *C. retusella* Thw., *C. sepiaria* var. *incanescens* (DC.) Hook. f. & Thoms., *C. sepiaria* var. *retusella* (Thw.) Thw., *C. sepiaria* var. *vulgaris* Hook. f. & Thoms.

Common names

Bengali: kaliakara; ***Gujarati***: kantharol; ***Hindi***: hiun, kanthari; ***Kannada***: basingi, kadukatri, kathari gida, volle uppi gidda; ***Marathi***: kanthar, mastondi, waghati; ***Oriya***: hulubhi, kontoko, solorakoli; ***Punjabi***: hingerna, hins, hiungara, hius; ***Sanskrit***: kanthari; ***Tamil***: karindu, karunjurai, kattukkattiri, kokkimullu, shenkathari, thoratti; ***Telegu***: nallapuyyi, nallavuppi, nalluppi, puyyi, uppi.

Description

A much-branched shrub or woody climber up to 5 m tall with curved stipular spines 1–3 mm long; young shoots more or less pubescent. Leaves alternate, oblong-elliptic or obovate, 2–6 cm long and 0.5–3.5 cm wide, apex rounded-obtuse or retuse, base acute, obtuse or rounded, pubescent on both surfaces, upper surface becoming glossy. Flowers white, 0.9–1.3 cm in diameter, borne in short-peduncled or sessile 8–18-flowered umbels; pedicels 1–2 cm long, filiform. Fruits (berries) fleshy, edible, globose, 0.6–1.3 cm in diameter, borne in clusters, deep purple to black when ripe, drying pale brown. Flowers between February and June; fruits mature during the rainy season (June–August).

Distribution and habitat

Native from tropical Africa to Australia. Common in open scrubland throughout the dry regions of peninsular India and the Andaman Islands, and occasionally in northern India. It is sometimes grown as a hedge.

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Medicinal properties and uses

The plant is credited with febrifugal, alterative, tonic and antiseptic properties, and is considered useful for treating skin diseases. A paste of the leaves is applied to relieve facial and other swellings following sunstroke among the Bhils. A decoction of the plant is useful for treating skin diseases. The juice of the inner bark of the root is used in the treatment of scabies and eczema. Among the Bhil and Nayaka tribes in northern Gujarat, a paste of the crushed roots along with ginger and asafoetida is applied externally as a treatment for mumps. The Irulars of Tamilnadu use the crushed root pulp as an external application to promote the healing of small wounds and scratches. In Maharashtra, the Agaris and Bhils use a decoction of the bark and the powdered root to treat gout and dropsy.

References

Asolkar *et al.* (1992), Chatterjee and Pakrashi (1991), Chopra *et al.* (1956), CSIR (1948–1992), Jain *et al.* (1989), Joshi (1989), Kirtikar *et al.* (1935), Ragupathy and Mahadevan (1991), Yoganarasimhan (1996).

Capparis spinosa L.

Botanical synonym

Capparis spinosa var. *vulgaris* Hook. f. & Thoms.

Common names

English: caper bush; ***Gujarati***: kalo kantharo, kantharo; ***Hindi***: ber, kabra; ***Kannada***: kathari mullina gida, katrimullinagidda, marattamaggu, mullukattari; ***Punjabi***: barar, kaur; ***Sanskrit***: himsra, kakadani, kartotti; ***Telegu***: kokilakshamu; ***Urdu***: kabar.

Description

A diffuse prostrate shrub or climber armed with divaricate light yellow to orange-coloured thorns (stipules). Leaves variable in texture, 1.2–3 cm wide, orbicular to elliptic, base rounded or cuneate, apex mucronate. Flowers handsome, white, axillary, solitary. Fruits (berries) 2.5–5 cm long, ellipsoid, ovoid or obovoid, with a thin pericarp; seeds smooth, globose, 3–4 mm in diameter.

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Distribution and habitat

Widely distributed in dry habitats from the Mediterranean and North Africa eastwards to Australia. It is found in dry, rocky and stony soils in northwestern India, through Punjab, Rajasthan, southwards through western and southern regions of peninsular India.

Medicinal properties and uses

The root bark is used extensively in Ayurvedic and Unani medicine, credited with aperitive, tonic, diuretic, expectorant, anthelmintic, emmenagogue and analgesic properties. It is used to treat rheumatism, paralysis, toothache, as well as splenic, renal and liver ailments. An extract of the plant is one of the constituents of the Ayurvedic preparation *Liv-52*, admistered to treat preliminary cases of acute viral hepatitis and cirrhosis of the liver, and has shown encouraging results against viral infections in humans. The plant extract is also a constituent of another Ayurvedic drug *Geriforte*, useful in the treatment of senile pruritis, itching and other ailments associated with old age and anxiety neurosis. The dried flower buds have an acrid, astringent taste and are useful for treating scurvy. The pickled flower buds constitute the commercial *capers*, used in cooking worldwide, and in India along with the fruits for flavouring pickles, relishes and sauces. The bruised leaves are used as a poultice in the treatment of gout.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

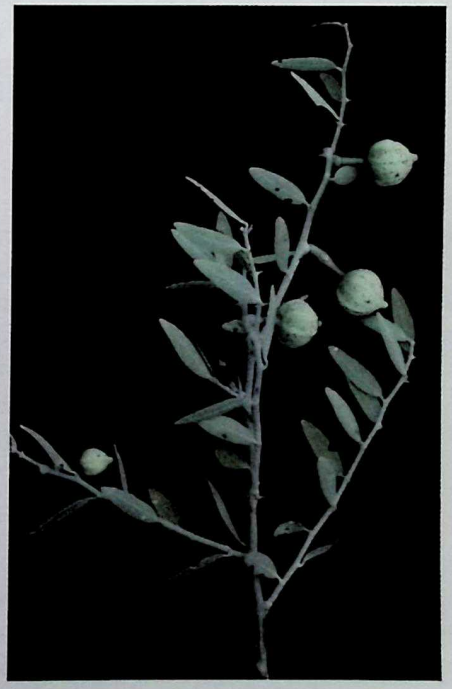
Capparis zeylanica L.

Botanical synonyms

Capparis hastigera Hance, *C. horrida* L. f., *C. xanthophylla* Coll. & Hemsl.

Common names

Bengali: kalokera; ***English***: Ceylon caper; ***Hindi***: ardanda, hins, jakhambel, jhiris, karawa; ***Kannada***: aathundi kaayi, anthundikai, govindaphala; ***Marathi***: govindi, gowindi, wag; ***Oriya***: govindi, lobhyotai, osaro, oserwa; ***Punjabi***: his, hiungarna, karvila; ***Sanskrit***: karambha, vyagranakhi; ***Tamil***: adandai, adondai, atanday, tondai; ***Telegu***: adonda, atonda.



Description

A much-branched climbing or rambling shrub, 1–10 m tall, armed with 2–6-mm-long, recurved, stipular thorns. Young branches brownish-red or greyish, tomentose, glabrous and shiny later. Leaves subcoriaceous, elliptic-obovate or broadly lanceolate, base rounded, apex mucronate, 4–11 cm long and 1.3–4.5 cm wide, venation prominent on both surfaces; petioles 0.3–0.8 cm long. Flowers profuse, showy, 5.1 cm in diameter, petals pinkish-white, later turning pink or reddish-violet, upper petals yellow at base, solitary or 2–6 together in axillary corymbs or cymes

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spread serially along branches. The edible fruit (berry) is subglobose, smooth, 3–5 cm in diameter on a thickened stalk, bright scarlet or purple when mature, 5–7-seeded; seeds globose, embedded in a gelatinous white pulp. Flowers between February and April and fruits in June in central India.

Distribution and habitat

Native to the Indo-Malaysian region from India to the Philippines, Malaysia, Java, the Celebes and Lesser Sunda Islands. It is found in most lowland localities in India from Uttar Pradesh eastwards and southward through peninsular India, commonly on hedges and bushes in dry forests and scrublands.

Medicinal properties and uses

The bitter root bark is considered a good appetizer, stomachic, demulcent, sedative, antihidrotic and is useful for relieving fever and colic. The leaves are used in northern India as a counter-irritant; ground into a paste, they are applied as a poultice to relieve glandular swellings, piles and boils. A decoction of the leaves is given in cases of syphilis. The leaves, ground with pepper, tamarind and garlic, are taken by the Irulars of Tamilnadu to increase appetite. The root and leaf are used in Ayurveda to treat oedema, glandular swellings and filariasis. The tender fruits are eaten as a vegetable among the tribal inhabitants of northern Andhra Pradesh.

References

Asolkar *et al.* (1992), Chatterjee and Pakrashi (1991), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Ragupathy and Mahadevan (1991), Ravisankar and Henry (1992), Yoganarasimhan (1996).

Cleome viscosa L.

Botanical synonyms

Cleome isocandra L., *Polanasia isocandra* (L.) Wight & Arn., *P. viscosa* (L.) DC.

Common names

Bengali: hurhuria; ***English***: wild mustard; ***Gujarati***: talvani, tilwan, tinmani; ***Hindi***: hulhul, hurhur; ***Kannada***: naballi, nayibela; ***Malayalam***: ariavila; ***Marathi***: harhuria, kanphodi; ***Punjabi***: bugra, hulhul; ***Sanskrit***: adityabhakta, arkakanta; ***Tamil***: nayikkadugu; ***Telegu***: kukhavominta; ***Urdu***: hulhul.

Description

An erect, simple or sparsely branched, unarmed annual herb up to 1.5 m tall with a strong, penetrating and unpleasant odour; stems grooved, densely clothed with glandular or simple hairs. Leaves 3–5-foliate, densely glandular-pubescent when young, petioles of the lower leaves 2.5–5 cm long, those of the upper leaves 0.4–3.8 cm; leaflets elliptic-oblong or obovate, 2–4.3 cm long and 0.8–2.5 cm wide, base cuneate to attenuate, apex acute or obtuse, the terminal leaflet larger than others, up to 4.3 cm

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long and 2.5 cm wide. Flowers various shades of yellow or white to pinkish or purple, 1.3 cm long, borne in the axils of reduced leaf-like bracts in lax corymbose racemes. Fruit a slender, erect, glandular-pubescent cylindrical capsule, 5–12 cm long; seeds about 1 mm in diameter, granular, black or dark brown. Flowers and fruits throughout the year.

Distribution and habitat

Distributed pantropically, but native to tropical Africa and Saudi Arabia through tropical Asia, including Malaysia, to Australia. It is found throughout tropical and subtropical India, commonly on rocky and sandy soils, in cultivated fields and along roadsides.

Medicinal properties and uses

The leaves are considered rubefacient, vesicant and sudorific. They are applied externally to promote healing of ulcers and wounds. Fresh cooked leaves are eaten as a vegetable for treatment of oedema. The leaf-juice, diluted with water and given internally in small quantities, acts as a sudorific in fever; compounded with honey, sesame oil and rock salt, it is reportedly used as an eardrop to treat inflammation, pain and pus formation in the middle ear. The leaf extract has strong antifungal properties; mixed with that of *Ocimum sanctum* (*Lamiaceae*), it is used as an eardrop to relieve ear ailments in north-eastern Karnataka. The seeds are considered carminative, anthelmintic, rubefacient and vesicant, and are used to remove roundworms and other worms, and to treat piles, splenic and liver disorders and syphilis. A poultice of pasted seeds is used to relieve chronic joint pains. The bark is irritant, acrid, rubifacient and vesicant.

References

Asolkar *et al.* (1992), Chatterjee and Pakrashi (1991), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Seetharam *et al.* (1999), Vijaya Kumar and Pullaiah (1998).

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Caricaceae

Carica papaya L.

Common names

Bengali: papeya, pappaiya, penpe; ***English***: papaya tree; ***Gujarati***: papayi, popaiyun; ***Hindi***: papaya, papita, popai; ***Kannada***: parangimara; ***Malayalam***: kappalam, kappanga, pappayam; ***Marathi***: papai, papaya; ***Oriya***: omrytobhonda, popoya; ***Sanskrit***: eranda karkati; ***Tamil***: pappali, pappayi, pasalai; ***Telegu***: boppayi, madanaba, parinda; ***Urdu***: erandkharbujah.

Description

A fast-growing, short-lived, single-stemmed small tree up to 10 m tall with a straight, cylindrical, soft, hollow grey trunk covered with large leaf- and inflorescence-scars and milky sap. Leaves alternate, crowded at the apex of the trunk forming a crown, long-petioled, glabrous, palmatifid. Flowers fragrant, pale yellow; male flowers in pubescent cymes in long, drooping panicles; female flowers large, solitary or in few-flowered clusters. Fruit (berry) large, variable in size, elongate to globose, with a large central cavity containing numerous black or grey seeds enclosed in a transparent aril. Numerous varieties are cultivated throughout the tropics that vary in fruit size, shape and flavour. Flowers and fruits throughout the year.

Distribution and habitat

Though presently unknown in its wild state, *papaya* probably originated in southern Mexico and Central America. It was introduced to India in the 16th century. It is grown commercially and in home gardens and is frequently naturalized throughout the warmer parts of India. It is an important plantation crop in many other tropical and subtropical countries.

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Medicinal properties and uses

Papaya fruit (both ripe and unripe) is highly valued for its nutritive and medicinal properties. The dried and salted fruit reduces enlarged spleen and liver. The salted, skinned unripe fruit is bandaged over snake bites to remove poison. The milky juice (latex) of the unripe fruits is considered anthelmintic, particularly useful for the expulsion of lumbricoid worms, and beneficial for treating spleen and liver enlargement, diarrhoea, ringworm and as a cosmetic to remove freckles; it is applied locally as an abortifacient. The ripe fruit is considered stomachic, digestive, carminative, galactagogue and diuretic. It is very effective in treating dysentery and chronic diarrhoea. Syrups and wines made from it are considered to be expectorant, sedative and tonic. The fruit is also useful in the treatment of bleeding piles and dyspepsia, and for removing urinary concretions and treatment of haemoptysis and urinary tract wounds. The seeds are considered carminative, emmenagogue, abortifacient and vermifuge. They are sometimes used as a counter-irritant. The juice of the seeds is prescribed to treat bleeding piles and enlargement of spleen and liver. A paste made of the seeds with glycerine is applied externally to relieve ringworm and psoriasis. The ripe seeds, taken with plain rice, are a useful treatment for diarrhoea. Papaya root is abortifacient and diuretic. It is given internally for checking irregular uterine bleeding. Ground and mixed with lime, the root is applied to the soles of feet to treat yaws, a bacterial disease. A fine paste of the young leaves is taken internally in severe cases of jaundice. The leaf juice is reportedly useful as a febrifuge (for expelling guinea worms) and for treating cardiac disease. An infusion of the young leaves is used to treat various urinary complaints and gonorrhoea. Fresh leaves are used as a dressing for wounds, and as a poultice to relieve sores. The flowers are used to treat jaundice, and their infusion is reported to have emmenagogue, febrifuge and pectoral properties. In addition to the fruits, the young leaves can be eaten (cooked); the pith of the stem is also edible (raw).

References

Asolkar *et al.* (1992), Chatterjee and Pakrashi (1992), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

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Casuarinaceae

Casuarina equisetifolia L.

Botanical synonyms

Casuarina litorea L., *C. muricata* Roxb.

Common names

Bengali: jau, jhau; ***English***: Australian pine, beefwood tree, casuarina, coast she-oak; ***Gujarati***: janglisaru, vilayatijhau, vilayatisaru; ***Hindi***: janglijhau, janglisaru, vilayatijhau, vilayatisaru; ***Kannada***: chabaku, chabuku, gali, kasrike, sarve, sura; ***Malayalam***: aru, chavukku, sampirani; ***Marathi***: janglisaru, sarova, sarpuhala, sura, suru; ***Oriya***: jhabuko; ***Tamil***: cavukku, chauku, chavukku, savukku; ***Telegu***: chavukku, chawku, saravi, saruguda, saruku, savuku.

Description

A tall, straight-stemmed, evergreen tree usually up to 25 m tall, branches bearing clusters of long, slender, green needle-like branchlets (cladodes); bark grey or rusty brown, brittle, peeling off in vertical strips, inner bark cream-coloured. Leaves whorled, reduced to minute scales. Flowers dioecious; male flowers in slender terminal spikes 1.1–2.3 cm long, female flowers in ovoid, cone-like heads 2.5–3.8 mm long. Fruiting heads echinate, hard, 1–2 cm in diameter; seeds light, membranous. Flowering occurs between February and May in most parts of India.

Distribution and habitat

Native to coastal regions in the Andaman Islands and from Bangladesh to Indonesia, subtropical Australia, the Philippines, Melanesia, Micronesia and Polynesia; introduced into many other tropical and subtropical locations worldwide. It is grown along the coasts of peninsular India and to a lesser extent in interior regions of peninsular India and northwestern India in windbreaks and in block plantations for fuelwood.

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powdered bark is used for treating acne, and its infusion as a tonic. Its decoction, taken in large doses, is used as an emmenagogue in the Philippines. The powdered (green) branchlets are boiled in oil and used as a remedy for ear diseases; their extract reportedly exhibits anti-cancer activity. Their decoction is given to treat colic and applied as a lotion for swellings. The powdered seeds are applied as a plaster to relieve headache, and the powdered fruit, mixed with nutmeg, is used to treat toothache.

Medicinal properties and uses

The bark is highly regarded as an astringent; its decoction, with the expressed juice of the seeds, is used for treating chronic diarrrhoea and dysentery. The

References

Asolkar *et al.* (1992), Chatterjee and Pakrashi (1991), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

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Celastraceae

Cassine glauca (Rottb.) O. Kuntze

Botanical synonyms

Celastrus glaucus (Rottb.) Vahl, *Elaeodendron glaucum* (Rottb.) Pers., *Mangifera glauca* Rottb.

Common names

Bengali: rajjehul; ***English***: Ceylon tea; ***Gujarati***: alan, alar; ***Hindi***: bakra, chouri, dhebri, jamras, jamrassi; ***Kannada***: kallurmara, mookavirae, mukarki, mukkatri, thanaroja; ***Konkani***: burkas; ***Malayalam***: karuniraka; ***Marathi***: aran, bhutapala, mothatarvad, tamruj; ***Oriya***: mokha, pisitondia; ***Punjabi***: bakra, jamoa, mirandu, padrium; ***Sanskrit***: asitamuskaka, bhutphal, khavalli, krishnamuskaka, mushkaka; ***Tamil***: irgoli, irgulipissin, kannirai, karkoa, karrukuva, karuvali, pirai, pujari, seluppai; ***Telegu***: bira, bhuthankusamu, kannilu, narija, nerasi, niradi.

Description

A graceful small to medium-sized tree with smooth greyish-white or black bark; inner bark red. Leaves opposite, thin, coriaceous, glabrous, shining above, glaucous beneath, highly variable in size and shape, elliptic, oblong or ovate-oblong, 3–15 cm long and 2.5–6.3 cm wide, apex acute or subacuminate (young leaves conspicuously acuminate), base acute or rounded, margins crenate-serrate; petioles 1–2 cm long. Flowers greenish-white or yellow, 0.4–0.5 cm across, borne in many-flowered axillary, lax, dichotomously branched panicles 7–8 cm long; pedicels slender; bracts small, ovate, acute; calyx very deeply divided, lobes unequal, orbicular, with membranous margins; petals 4 mm long, oblong, obtuse. Fruits (drupes) obovoid, apiculate, 0.8–1.2 cm long, fleshy, yellowish-green, 1-seeded.

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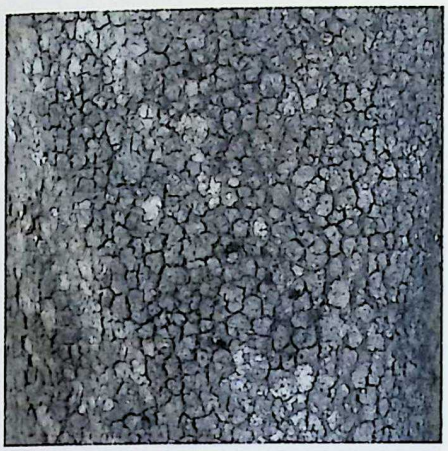

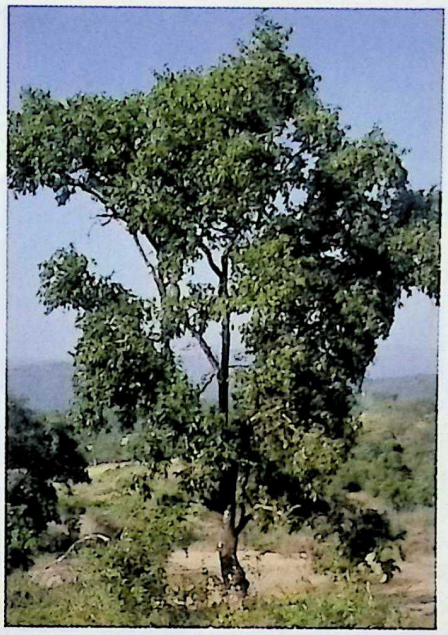

Distribution and habitat

Native to tropical Asia from India and Sri Lanka to Thailand. Generally scattered in its distribution, most commonly in dry and mixed deciduous forests or scattered in sal (*Shorea robusta*)-dominated forests in the sub-Himalayan hills up to 1800 m elevation, particularly in northwestern Uttar Pradesh, and throughout peninsular India. The tree prefers clay soils. It is occasionally planted as an ornamental in gardens.

Medicinal properties and uses

Various parts of the tree are used in traditional medicine. Among the Gonds of Uttar Pradesh, the root bark extract is given orally for the treatment of rheumatism and gout, as well as for dysentery; the fruit paste together with that of *Catunaregam spinosa* (*Rutaceae*) and wheat flower is reportedly used to induce abortion. In Ayurveda, the bark and flowers are reportedly used to treat wounds, dysuria, burning sensations and hyperacidity. In Siddha, the root is used as an antidote to snake bite; ground into a paste with water, it is also applied to relieve swellings. A paste of the stem bark is used as an external application and given orally to treat snake bite among the Mundas of southern Bihar. The powdered leaves have a strong sternutatory action, and are used as snuff to relieve headache. They are also used as a fumigatory to treat hysteria. A decoction of the leaves is given in the treatment of eczema and other skin ailments.

Warning

The root is emetic and can be fatal when taken internally in large doses.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Kumar and Goel (1998), Varma (1997), Yoganarasimhan (1996).

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Celastrus paniculatus Willd.

Botanical synonyms

Celastrus multiflorus Roxb., *C. nutans* Roxb.

Common names

Bengali: lataphataki, malkangni; ***English***: black-oil plant, climbing staff tree, intellect tree; ***Gujarati***: malkangana, malkankanino, velo; ***Hindi***: apang, kondgaidh, malkagni, malangni, malkamini, pheng, sankhu; ***Kannada***: bhavanga beeja, kariganne; ***Malayalam***: palulavam; ***Marathi***: dhimarbel, kanguni, pigavi; ***Oriya***: korsana, korsano, peng navbadhu, pengu; ***Punjabi***: sankhu; ***Sanskrit***: jyotismati, kanguni, paravatapadi, pitataila; ***Tamil***: adibaricham, kaligam, manja-kodi, sodiyam, valuluvai; ***Telegu***: bavangi, gundumeda, manirteega, palleru; ***Urdu***: malkanguni.

Description

A large, woody, climbing shrub up to 10 m tall; bark yellowish or pale brown, corky, exfoliating in small, soft scales, inner bark pink, finely streaked with red or reddish-brown; twigs smooth, reddish-brown, densely covered with small, elongate white lenticels. Leaves broadly elliptic-ovate or obovate, 4.5–15 cm long and 2.5–8 cm wide, apex acute to shortly acuminate; base cuneate, margins crenate-serrate; lateral nerves 5–8 pairs, midrib elevated on both surfaces; petioles 0.8–1.5 cm long. Flowers unisexual, yellowish or greenish-white, *c.* 3.8 mm in diameter, borne in pendulous terminal panicles 5–20 cm long. Fruit a subglobose capsule 0.5–1 cm long and 0.5–0.8 cm in diameter, bright yellow when mature, 3-valved, 1- to 6-seeded; seeds ellipsoid or ovoid, transversally wrinkled, reddish-brown, up to 6 mm long, enclosed in a fleshy, scarlet aril. In central India flowering occurs between April and June and fruiting from October to December; trees remain leafless for a short period between March–April and April–June.

Distribution and habitat

Occurs naturally from South Asia eastwards through Indochina to Australia and New Caledonia. Found throughout most of India up to an altitude of 1800 m, chiefly in deciduous forests.

Medicinal properties and uses

The seeds are credited with emetic, diaphoretic, febrifugal and nervine properties, and are used in traditional Indian medicine for sharpening the memory and to cure sores, ulcers, rheumatism and gout. The seed oil acts as a powerful stimulant; it is also used in the treatment of scabies, body and rheumatic pains, wounds, eczema, beri-beri and paralysis; among the tribal inhabitants of southern Bihar, it is also used to treat intestinal ulcers and tuberculosis. The seed and seed oil are used in Ayurveda to treat epilepsy, stomach disorders, psychosis, oedema, diseases

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of the nervous system, and as a brain tonic. A drug combination containing the seed oil has shown good results in the treatment of hysteria in clinical trials without any side effects. In Siddha, the leaf and seed oil are used to treat diarrhoea, cough, constipation, menorrhagia and ulcers. The leaves and roots are used as a poultice to cure headache. An infusion of the leaves mixed with the juice of *Centella asiatica* (*Apiaceae*) is reportedly taken as a nervine tonic among the Rabaris in the Barda Hills of Gujarat. The crushed root is used to treat pneumonia. The root, made into a paste with rice water and black pepper, is taken internally by inhabitants of the Gandhamardan Hills in Orissa as a remedy for spermatorrhoea, leucorrhoea and piles. Among the Gonds of Uttar Pradesh, the powdered root is considered useful for the treatment of cancerous tumours. The bark is used as an abortifacient. Various parts of the plant are reportedly used to treat sore throat, anaemia, colic, syphilis and carbuncles.

References

Asolkar *et al.* (1992), Brahmam and Saxena (1990), Chopra *et al.* (1956), CSIR (1948–1992), Girach and Aminuddin (1995), Jadeja (1999), Kirtikar *et al.* (1935), Varma (1997), Yoganarasimhan (1996).

Maytenus senegalensis (Lam.) Exell

Botanical synonyms

Catha montana (Roth) G. Don, *Celastrus emarginatus* Willd., *C. montanus* Roth. in Roem. & Schult., *C. senegalensis* Lam., *Gymnosporia montana* (Roth.) Benth., *G. emarginata* (Willd) Thwaites, *Maytenus emarginata* (Willd.) Ding Hou

Common names

Bengali: vaichigachha; ***English***: thorny staff tree; ***Gujarati***: vikalo, vikaro, viklo; ***Hindi***: baikal, kingani, tondarsaijhad, vingar; ***Kannada***: mal-kanguni, tanasimale, tandraja, tandrasa, tandrasi; ***Marathi***: bharati, yekaddi; ***Oriya***: gouro, gourokosa, kosai; ***Punjabi***: kharai; ***Sanskrit***: vikankala; ***Tamil***: kattanji, nandunarai, valuluvai; ***Telegu***: chinta, danti, pedda chintu.

Description

A much-branched, spiny or unarmed shrub or small tree, usually evergreen. Leaves variable in size and shape, obovate to oblanceolate or elliptic, 2.5–8 cm long and 1.5–4 cm wide, usually rounded or emarginate at apex, margins entire or crenulate, base rounded or obtuse, subcoriaceous; petioles 0.3–1 cm long. Flowers small, white, borne in axillary cymes; pedicels filiform, jointed below the middle, 3.5–5 mm long; bracts small, lanceolate, acute; calyx lobes broadly elliptic-oblong, rounded at the apex, ciliate; petals 3 mm long, elliptic-oblong. Fruits (capsules) broadly obovoid or subglobose, 10–12 mm long and 8–9 mm in diameter, purplish or black when ripe, 3-celled; seeds ovoid or ellipsoid, 2.5–3.5 mm long, red with a fleshy aril.

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Flowers sporadically throughout the year with peak flowering from October and December and fruiting between January and April in peninsular India.

Distribution and habitat

Occurs naturally in dry regions throughout nearly all the Old World tropics and subtropics, from tropical Africa and the Mediterranean eastwards through South and Southeast Asia to Malesia and northern Queensland, Australia. Common in dry scrub forests throughout India, particularly on poor soils in central and western peninsular India.

Medicinal properties and uses

In Ayurveda, the sour, sweet, acrid fruits are considered to be digestible, stomachic, cooling and blood-purifying; they are used to treat biliousness, ulcers, piles, thirst and corneal opacities. The bark is ground to a paste and applied with mustard oil to kill head lice. Among the rural inhabitants of Bhavnagar District in Gujarat, the leaves are reportedly chewed, or the leaf juice taken orally, for treating jaundice and other liver disorders. The leaves, crushed with those of

Datura metel (*Solanaceae*), are reportedly used as an external application to tumours associated with plague among the Rabaris in the Barda Hills of Gujarat. The pulverized leaves are given in milk as a vermifuge. A decoction of the leafy twigs is used as a mouthwash to relieve toothache. In Africa, the root is reportedly used to treat dysentery.

Reference

Bhatt and Mitaliya (1999), Bhatt *et al.* (1999), Chopra *et al.* (1956), CSIR (1948–1992), Jadeja (1999), Kirtikar *et al.* (1935).

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Chenopodiaceae

Chenopodium album L.

Common names

Bengali: bathusag, bethuasag, chandanbetu; ***English***: lamb's quarter, white goosefoot, wild spinach; ***Gujarati***: cheel, tanko; ***Hindi***: bathua, bathusag, bethuasag, chandanbedu, chilli; ***Kannada***: chakravati, huchachakkota, huchuchakkotha; ***Marathi***: chakavata, chakvar, chivil; ***Punjabi***: bathu, bathua, jausag, lunak; ***Sanskrit***: agaralohita, chillika, ksharadala, vastuka, vastukah; ***Tamil***: parapukkirai, parupukkirai; ***Telegu***: pappukura.

Description

A polymorphous, non-aromatic, erect herb 0.3–3 m tall with angled stems that are often striped green, red or purple, clammy to the touch. Leaves very variable in size and shape, rhomboid, deltoid to lanceolate, upper leaves entire, lower ones toothed or irregularly lobed (extremely variable in cultivated types), 10–15 cm long, with petioles often as long as leaf blades. Flowers green, borne in clusters forming a compact or loosely panicled axillary spike; sepals 1.5–2 mm long, oblong-lanceolate, keeled, closing over the thinly membranous utricle. Fruit (utricle) with round, compressed, shining, black seeds. Flowers and fruits during the winter months.

Distribution and habitat

Native to Europe, the plant is cultivated as a vegetable and grain crop throughout India to an elevation of 4700 m in the Himalayas; often naturalized near cultivated fields, along roads and in other open, disturbed habitats.

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Medicinal properties and uses

An infusion or decoction of the herb is considered to be diuretic, laxative and anthelmintic. The leaves are antiscorbutic and yield ascaridole, which is used to treat round- and hookworms. The powdered leaves are used externally as an antiseptic, and the leaf juice is used to relieve burns. A decoction of the leaves and stems, mixed with alcohol, is used as a rub to relieve arthritis and rheumatism. The seeds are used to treat hepatic disorders and spleen enlargement.

References

Asolkar *et al.* (1992), Chatterjee and Pakrashi (1991), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

Chenopodium ambrosioides L.

Common names

Bengali: chandanbeto; ***English***: American wormseed, Mexican tea; ***Hindi***: khatua; ***Kannada***: guddavoma, kadavoma, kaduoma, kaduvoma; ***Malayalam***: kattayamodagum, katu ayamoddakam, pookalachili; ***Sanskrit***: kshetravastuka, swetachilli; ***Tamil***: kattasambadam.

Description

A profusely branched, erect herb or shrub with a strong camphorous smell, up to 1.5 m tall; stems angular-ribbed, short, pubescent, often purple-tinged. Leaves variable, linear-lanceolate to oblong-ovate, 4–10 cm long and 1–3.5 cm wide, lower leaves coarsely serrate-dentate, upper ones subentire, glandular. Flowers greenish, some turning purple, borne in small clusters together forming slender, simple or paniculate, axillary and terminal spikes. Fruits more or less globular; seeds small, reddish-brown to black, nearly smooth, with a bitter pungent taste. Flowers and fruits between September and July.

Distribution and habitat

Native to tropical and subtropical regions of North and South America. Naturalized almost throughout India to an altitude of 2300 m in the Himalayas as a weed in cultivated fields and other open, disturbed habitats; more common in Bangladesh, West Bengal, Kashmir and south India than in other parts of the Indian subcontinent.

Medicinal properties and uses

The herb is considered tonic, pectoral, emmenagogue and antispasmodic, and is used to treat nervous conditions, particularly chorea. The dried herb and the oil extracted from the seeds are used as anthelmintic against intestinal parasites including roundworms and hookworms. A tincture of the green leaves is prescribed as a cough suppressant. The bruised leaves are used externally to promote healing of ulcers and sores. A decoction of the herb is given as an internal haemostatic, and the infusion as an enema to treat intestinal ulceration; the infusion is also diuretic and sudorific and used to treat colds and stomach-ache.

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The leaves and tender shoots are eaten as a vegetable. The plant has been used in traditional medicine in North and South America for centuries; in South America infusions made from the leaves and seeds have long been used as a household remedy against intestinal parasites.

Warning

The herb can cause mild hay fever; the seed oil is highly toxic and should not be taken internally.

References

Asolkar *et al.* (1992), Chatterjee and Pakrashi (1991), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

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Clusiaceae

Calophyllum inophyllum L.

Common names

Bengali: kathchampa, nagakesar, punnag, punnangachcha, rajachampaka, sultanachampa; ***English***: Alexandrian laurel, dilo oil tree; ***Gujarati***: punnaga, ratinagkesar, surapunnaga, udi; ***Hindi***: nagkesar, pulaka, punnaga, sultanachampa, surpunka, undi; ***Kannada***: gadhavunate, honne, hoohonae, nameru, suragi, surahonne, vuma, wundy; ***Konkani***: ranundi, suringi, surong, surongi; ***Malayalam***: pinna, punna, surampunna; ***Marathi***: godiyundina, nagchampa, punnag, surangi, undali, undi; ***Oriya***: polang, ponnang, poonang, sorongo; ***Sanskrit***: punnaga, punnagah, tunga; ***Tamil***: pinnai, punnagam, punnai, surabunnagam, surabunnai, valai; ***Telegu***: ponnachettu (tree), ponnaginjalu (seeds), pouna, suraponna, surapunnagamu.

Description

A small or medium-sized tree up to 20 m tall with a crooked trunk; bark pale grey to dark brown, smooth, with boat-shaped fissures. Leaves 10–18 cm long and 7.5–10 cm wide, broadly elliptic-oblong or obovate, apex rounded, often emarginate with wavy margins and very close lateral nerves, base acute; petioles 0.9–1.5 cm long, stout, flat. Flowers 1.9–2.5 cm in diameter, marble-white, fragrant, borne in lax few-flowered axillary racemes 10–15 cm long; sepals 4, ovate-orbicular, concave, reflexed; petals 4, oblong, obtuse, spreading. Fruit globose, 2.5–3.8 cm in diameter, smooth, light yellow to pale reddish-orange when ripe; pericarp thick, pulp scanty; seed globose, nearly as large as fruit, hard.

Distribution and habitat

Native to littoral regions of the Old World tropics from the islands off the coast of eastern Africa to Polynesia. In India it is found in the coastal forests of Maharashtra, Karnataka, Kerala, Tamilnadu, Andhra

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Pradesh, Orissa and the Andaman Islands; it thrives on sandy soils. It is often grown as an ornamental tree.

Medicinal properties and uses

The astringent bark is used in Ayurveda to heal ulcers and inflammations of the eye, and in preparations for improving the complexion. It is also used to treat internal haemorrhage. Its juice is used as a purgative. The oil obtained by steeping the greenish-yellow gum (latex exuded from the cut branches or stem) mixed with strips of bark and leaves is used as an application to relieve sore eyes, and is also considered to be a useful remedy for indolent ulcers. The oil expressed from the seed kernels has strong antibacterial properties and is useful for treating scabies and other cutaneous diseases, gonorrhoea and gleet; it also possesses anti-inflammatory properties and is considered a useful embrocation in the treatment of rheumatism and gout. The watery paste expressed from the seed kernels is considered a useful substitute for the seed oil for treating joint pains.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935).

Garcinia gummi-gutta (L.) Robs.

Botanical synonyms

Garcinia cambogia (Gaertn.) Desr., *G. cambogia* var. *conicarpa* (Wight) Anderson, *Mangostana cambogia* Gaertn.

Common names

Kannada: mantulli, simai hunase, upagi mara; ***Malayalam***: kadumpuli, kodapuli, pinaru; ***Marathi***: dharambe; ***Sanskrit***: vrksamlah; ***Tamil***: kodakkapuli; ***Telegu***: simachinta.

Description

A small or medium-sized tree with a rounded crown and horizontal or drooping branches. Leaves dark green and shining, elliptic-obovate, 5–13 cm long and 2.5–7.5 cm wide. Male flowers fascicled; female flowers solitary. The edible fruit (berry) is

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ovoid, 5 cm in diameter, yellow or red when ripe, with 6–8 grooves. Seeds 6–8 surrounded by a succulent aril. Flowers during the hot season (April–June) and fruits ripen during the rainy season (July–October).

Distribution and habitat

The tree is common in the evergreen forests of the Western Ghats, from Konkan (southwestern Maharashtra) southwards to southern Kerala, and in the Shola forests of Nilgiris to an altitude of 1800 m.

Medicinal properties and uses

The dried fruits are rich in tartaric acid and possess marked antiseptic properties. A decoction of the fruit rind is taken internally to treat rheumatism and bowel complaints. The resin obtained from the cut bark is used as a purgative.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956), CSIR (1948–1992), Yoganarasimhan (1996).

Garcinia indica (Roxb.) Jessop

Botanical synonyms

Brindonia indica Dupetit-Thouars, *Garcinia purpurea* Roxb.

Common names

English: brindonia tallow tree, kokam butter tree, mangosteen oil tree, wild mangosteen; ***Gujarati***: kokan; ***Hindi***: kokam; ***Kannada***: dhupadamara, kokam mara, murgala, murginahali, tittidika; ***Konkani***: birondd, birondi, ratambi; ***Malayalam***: punampuli; ***Marathi***: amsol, bhirand, katambi, kokam, ratamba; ***Sanskrit***: amlavetasa, tintidika, vrksamla; ***Tamil***: murgal.

Description

A small, slender, evergreen tree with drooping or spreading branches. Leaves obovate-oblong or elliptic-lanceolate, 6.3–9 cm long and 2.5–3.8 cm wide, red when young, older leaves dark green above and pale beneath, glabrous with entire, repand margins; petioles 0.6–0.9 cm long. Flowers axillary or terminal, solitary or in spreading fascicles; pedicels 4–8 mm long or absent; bracts scale-like, deciduous; sepals *c.* 4.5 mm long, decussate, thick and fleshy; outer smaller, oblong-ovate, inner larger, obovate-orbicular; petals 4, thick, a little longer than the sepals; male flowers 3–8 together; female flowers solitary or 2–3 together. The edible fruit (berry) is globose or spherical, 2.5–3.8 cm in diameter, dark purple when ripe, enclosing 5–8 large, compressed seeds embedded in a purple pulp. Flowers from November to February and fruits ripen from April to May.

Distribution and habitat

The tree is found in the evergreen forests of the Western Ghats, from southwestern Maharashtra to southern Karnataka, Kerala and western Tamilnadu. Often planted in

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southern Maharashtra and elsewhere in its native south Indian range as an oil producer.

Medicinal properties and uses

In Ayurveda the fruit is considered anthelmintic and cardiotonic and useful for the treatment of piles, dysentery, tumours, pains and heart ailments. A syrup from the fruit is given to treat bilious disorders. The seeds yield an edible oil known commercially as *Kokam butter*, which is considered astringent, demulcent, emollient and soothing. It is used for ointments, suppositories and other pharmaceutical purposes; applied locally, it is useful for promoting healing of chapped or cracked lips, hands and feet.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

Garcinia xanthochymus Hook. f. & T. Anderson

Botanical synonyms

Garcinia pictorius (Roxb.) A. Arcy, *G. tinctoria* Dunn, *Xanthochymus pictorius* Roxb., *X. tinctorius* DC.

Common names

Bengali: chalate, tamal; ***English***: egg tree; ***Gujarati***: karamala, ota; ***Hindi***: dampel, ota, tamal; ***Kannada***: deavki, devagarige, devangi, gansargi, javangi, neralemavu; ***Konkani***: dharambe, ***Malayalam***: anavaya, jharambi, ota; ***Marathi***: jharambi, ota; ***Oriya***: cheoro, sitambu; ***Sanskrit***: tamala; ***Tamil***: kulavi, malaippachi, mukki, tamalam; ***Telegu***: ivarumidi, iwara mamadi, sitakamraku, tamalamu.

Description

A medium-sized to large, bushy, evergreen tree, with a straight bole and angular spreading branches arising in tiers; bark dark, scabrous; twigs quadrangular. Leaves large, coriaceous, shining, bright green, 20–45 cm long and 4–10 cm wide, linear-oblong or oblong-lanceolate, apex acute or acuminate; petioles 1.2–2.5 cm long. Male flowers white, *c.* 2 cm in diameter, borne in 4–8-flowered fascicles in the axils of fallen leaves; pedicels 2.5–3.8 cm long; sepals 5, fleshy, 4–6 mm long, unequal, orbicular, concave, persistent; petals 5, orbicular, spreading, 8 mm in diameter. Hermaphrodite flowers similar to those of the male but with longer pedicels. Fruits

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(berries) smooth, globular, 5–9 cm in diameter, with a prominent beak, yellow when ripe; seeds 1–4, oblong. Flowers during spring and fruits in summer.

Distribution and habitat

Considered to be native to India and Myanmar (Burma), and found widely distributed on a variety of soil types up to 1200 m elevation in the lower hill forests of the eastern Himalayas from Assam to Bihar, in Orissa, and in the Western Ghats from Maharashtra southwards to Tamilnadu and Kerala, and in the Andaman Islands.

Medicinal properties and uses

The fruit has a juicy pulp with a pleasant, acidic flavour; it is used as a cooling drink to treat biliousness and as a substitute for the fruit of *Garcinia indica*. The fruit is considered anthelmintic and cardiotonic, and useful for improving appetite. The seeds contain an antiscorbutic oil that is a potent remedy for dysentery and diarrhoea.

The bark is astringent, useful for treatment of dysentery. The fruit is used for preserves and jams, and as a substitute for tamarind paste in curries.

References

Asolkar *et al.* (1992), Chatterjee and Pakrashi (1992), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

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Cochlospermaceae

Cochlospermum religiosum (L.) Alson

Botanical synonyms

Bombax gossypium L., *B. religiosum* L., *Cochlospermum gossypium* DC.

Common names

Bengali: gabdi, golgol; ***English***: buttercup tree, torch-wood tree, yellow silk-cotton tree; ***Gujarati***: ganeri, ganiar, ganocch, gungdi, pahadvel, venivel; ***Hindi***: gabdi, galgal, ganeri, ganiar, kumbi; ***Kannada***: adaviburaga, arasinaburaga, bettatavare, buruga, gagili, kaduburaga; ***Malayalam***: appakudakka, appakuttaka; ***Marathi***: galgal, gangeri, ganglay, gokul; ***Oriya***: bendia murdoni, beniyamrydami, konokopolaso, kontopalas, pobosokoniari, popso koniari; ***Punjabi***: kumbi; ***Tamil***: elluva, kongillam, kongu, tanakku, tanaku; ***Telegu***: adaviburuga, konda-buraga, kondagogu, kongu, pethiri, puliki; ***Urdu***: katira.

Description

A small deciduous tree up to 7.5 m tall with smooth, deeply furrowed, fibrous, ash-grey bark. Leaves alternate, palmately 3–5-lobed, 7–22 cm long and 5–12 cm wide, apex acuminate with a blunt tip, base acute, glabrous above, tomentose beneath; petioles usually 10–18 cm long; stipules linear, 5–7 mm long. Flowers bright yellow, 7–13 cm in diameter in terminal panicles with tomentose peduncles; pedicels stout, 5–13 cm long, grooved and twisted, pubescent; sepals unequal, oblong, concave, silky outside; petals obovate, deeply emarginate; flowers appear before the new leaves. Fruit (capsule) 5–7.5 cm long, obovoid, striate outside, 5-valved; seeds 5.5 mm long, covered with white silky wool. Flowers between January and April; fruits ripen between March and July in central India.

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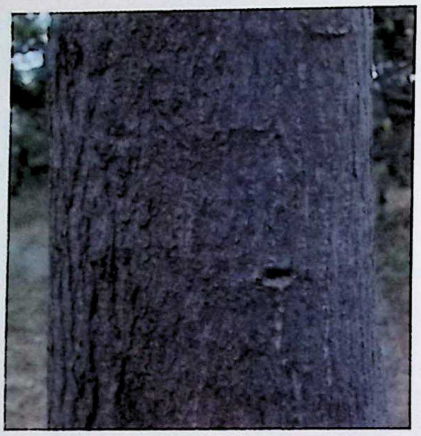

Distribution and habitat

Native to central and southern India, Bangladesh and Myanmar (Burma). Common in dry forests, especially on rocky slopes throughout peninsular India; less common in western coastal districts.

Medicinal properties and uses

The gum exuded from the cut bark is considered sweetish, cooling, stomachic and sedative; it is used in Unani medicine to treat gonorrhoea, syphilis, asthma, eye troubles and trachoma, and cosmetically to soften skin; it is also used to relieve coughs. The dried leaves and flowers are used as stimulants in Punjab.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956), Kirtikar *et al.* (1935).

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Colchicaceae

Gloriosa superba L.

Common names

Bengali: bishalanguli, ulatchandal; ***English***: climbing lily, Malabar glory lily; ***Gujarati***: dudhiovachnag, varhvardi; ***Hindi***: kalihari, karihari, languli; ***Kannada***: agnisikhe, akkatangaballi, karadikanninagadde, koli kutamana gedde; ***Malayalam***: malattamara, medoni, mettonni; ***Marathi***: indai, kallavi, kariannag, nagkaria; ***Oriya***: agni-ikha, gorbhoghhatono, meheria-phulo, ognisikha, panjangulia; ***Punjabi***: kariari, mulim; ***Sanskrit***: agnimukhi, ailni, garbhaghatini, kalikari, langali, langli, shankrapushpi; ***Tamil***: akkinichilam, kalaippaikkishangu, kalappaikkilangu, kannuvelli; ***Telegu***: adavinabhi, agnisikhha, ganjeri, kalappagadda, pattidumpa; ***Urdu***: kanol, kulhar.

Description

A branched, herbaceous climber with annual, slender stems arising from a perennial, fleshy, tuberous rhizome; rhizome cylindrical, bifurcated, usually V-shaped with the two limbs 20–30 cm long and 2.5–3.8 cm in diameter. Leaves alternate, opposite or whorled, 7.5–15 cm long and 2–4.5 cm wide, ovate-lanceolate, apex acuminate and spirally twisted to serve as a tendril. Flowers showy, large, solitary or in clusters, perianth segments greenish changing to bright golden yellow and scarlet with wavy margins. Fruits (capsules) linear-oblong, greenish-yellow, about 4.5 cm long and 2 cm in diameter, containing many globose seeds. In central India, plants appear with the onset of the rains; flowering occurs in August and September and fruiting in September and October.

Distribution and habitat

Distributed throughout tropical India in open or secondary forests from sea level to about 2000 m elevation, growing under a

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variety of soil conditions. Common in hedges, chiefly on black soils in central India and throughout southern India; often cultivated in gardens throughout India. Also found in tropical and southern Africa, Madagascar, Indonesia and Malesia.

Medicinal properties and uses

In Ayurveda the tuber (root) is considered anthelmintic, laxative and alexiteric; it is used to treat chronic ulcers, leprosy, inflammation, piles, abdominal pains, itching and thirst. The powdered tuber is reportedly used in the form of a paste as a local application for parasitic skin diseases, as a cataplasm for relieving rheumatic pains, and as an external application to promote the expulsion of the placenta after childbirth. The white, starchy powder obtained after repeated grinding and washing of the tubers is reportedly taken to treat gonorrhoea and as an abortifacient.

Warning

Although the drug is reportedly taken internally in very small doses (5–10 grains) as a tonic, stomachic and anthelmintic, it is an extremely poisonous gastrointestinal irritant, causing vomiting and purging.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935), Sivarajan and Balachandran (1994), Vijaya Kumar and Pullaiah (1998), Yoganarasimhan (1996).

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Combretaceae

Anogeissus latifolia (Roxb. ex DC.) Wallich ex Guill. & Perr.

Botanical synonym

Conocarpus latifolia Roxb. ex DC.

Common names

Bengali: chakwa, dhaoya; ***English***: button tree, dindiga tree, ghatti tree; ***Gujarati***: dabria, damora, dhavdo, dhemodo, dhendo; ***Hindi***: bakla, bakli, dhaura, dhawa; ***Kannada***: bejjalu, dindala, dindiga, dinduga; ***Konkani***: dindal; ***Malayalam***: malakanniram, marukanchiram, vellanava; ***Marathi***: dabria, dandua, dhamora, dhaunda, dhaura, dhavda; ***Oriya***: dhobu, dhonda, dohu; ***Punjabi***: bakli, chal, dhao; ***Sanskrit***: dhava, dhavah; ***Tamil***: namai, namme, vekkali, vellagagai; ***Telegu***: chirimanu, chirumenu, sheriman, tiruman, vellama, vellamaddi; ***Urdu***: bakla, banti.

Description

A small to fairly large deciduous tree, up to 33 m tall, with a deeply fluted stem base; bark pale yellowish or pinkish-brown, spotted with paler greenish or greenish-yellow depressions, exfoliating in thin rounded flakes which leave shallow depressions. Leaves alternate or subopposite, 6.3–10 cm long and 3–5 cm wide, elliptic-oblong or elliptic-ovate, obtuse, acute or retuse at apex, rounded to cordate at base, coriaceous, glabrous, reddish when they first appear and turning red before falling off. Flowers minute, greenish-yellow, borne solitary or in globose heads on short, pubescent, axillary peduncles. Fruits yellowish-brown or reddish-brown, *c.* 1 cm long, shining, beaked, winged, borne in globose clusters, 1-seeded; seed wedge-shaped. In central India flowers from May to July and fruits from November to January; in Karnataka, flowering occurs from August to January. In central Indian deciduous forests, trees remain leafless between January–February and May–June.

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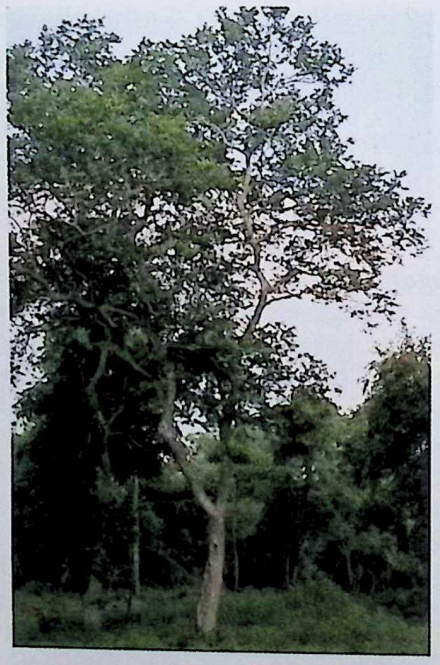
Distribution and habitat

Native to India, Nepal and Sri Lanka; common in dry and moist deciduous forests of the sub-Himalayan tract and hill forests throughout India (except in Assam) to an elevation of 1200 m.

Medicinal properties and uses

In Ayurveda, the bitter, astringent bark is used to treat polyuria, anaemia, piles, leprosy, and is particularly useful for treating chronic diarrhoea. A paste of the stem bark is used externally to relieve body swellings among the Sahariyas of northwestern Madhya Pradesh. A dilute paste of the bark is used as an external application by the tribal inhabitants of Sundargarh District in Orissa to relieve thoracic pain; in this region a decoction of the bark is used to treat skin diseases, and the latex from the cut bark for treating skin ulcers. Among the tribal inhabitants of south-central Andhra Pradesh, the juice from the stem bark is used to treat cough and asthma, and a paste of the dried, powdered stem with water is applied to the forehead to relieve headache. The opaque white gum exuded from the cut bark, known commercially as *Ghatti* or *Indian gum*, is administered as a tonic to women after childbirth; in Prakasam District of Andhra Pradesh, it is given mixed with water to treat leucorrhoea. It is also used as a substitute for gum arabic (from *Acacia nilotica*) in various pharmaceutical preparations. The tree is highly valued for its timber, a good substitute for teak (*Tectona grandis*) and sal (*Shorea robusta*), used for a variety of purposes. The gum is used as an emulsifier, stabilizer and thickener in calico printing, ceramics, foods (particularly confectionery) and pharmaceuticals; in Maharashtra it is reportedly eaten after frying. The dried young leaves and twigs are a well-known tanning agent.



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Combretum decandrum Roxb.

Botanical synonyms

Combretum roxburghii Spreng., *Poivrea roxburghii* DC.

Common names

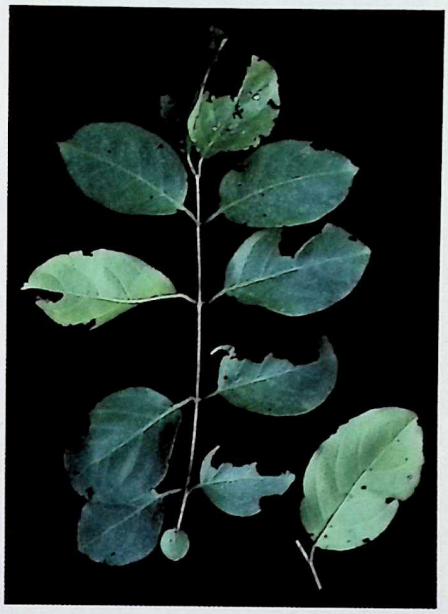
Hindi: punk, rurel, roel; ***Marathi***: piwarvel; ***Oriya***: atundi; ***Telegu***: arikota, bontatige.

Description

A large, climbing shrub; young parts pubescent. Leaves opposite, simple, to 20 cm long and 10 cm wide, elliptic-oblong, apex abruptly acuminate, nearly glabrous; main nerves 6–8 pairs; petioles very short. Flowers greenish-white, borne in cylindrical racemes forming terminal panicles; floral bracts large, turning creamy-white and very conspicuous prior to flowering. Fruit 2–3 cm long, 5-winged. Flowers between November and March and fruits from April to June in central India.

Distribution and habitat

Found in deciduous forests throughout India, commonly along streams in hill forests of central India and in open forest land in southern Orissa and eastern Andhra Pradesh.



Medicinal properties and uses

The seed oil is used to treat eczema. The raw leaves are sometimes eaten to relieve diarrhoea and gastric troubles. In West Africa, the leaves are used in the treatment of malarial fevers.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956).

Quisqualis indica L.

Common names

English: Chinese honeysuckle, Rangoon creeper; ***Gujarati***: barmasi, barma sinivel; ***Hindi***: Rangoonkibel; ***Kannada***: Rangoon kempu malle; ***Marathi***: lalchameli, rangun-chaval; ***Tamil***: ilengaramalligai, irangun-malli; ***Telegu***: ettaguttilativva, rangonimalle, tigeganneru.

Description

A large, woody, climbing shrub. Leaves opposite or subopposite, elliptic or elliptic-oblong, apex acuminate, margins entire, glabrous above, hairy beneath; leaf size variable, usually 7.5–10 cm long and 3.5–4 cm wide; petioles *c.* 7.5 mm long; main nerves 6–8 pairs. Flowers numerous, white or red, fragrant, borne in pendulous axillary racemes; calyx tube and triangular, acute lobes *c.* 6 cm long, pubescent; petals lanceolate, acute, 1.3 cm long. Fruit dry, coriaceous, ovate-elliptic, up to 4 cm long and 1.3 cm broad, acutely 5-angled or 5-winged, 1-seeded. Flowers nearly year-round in India, but mainly in March and April in central India; flowers white upon opening in the evening, gradually turning pink by morning and deep red by late afternoon.

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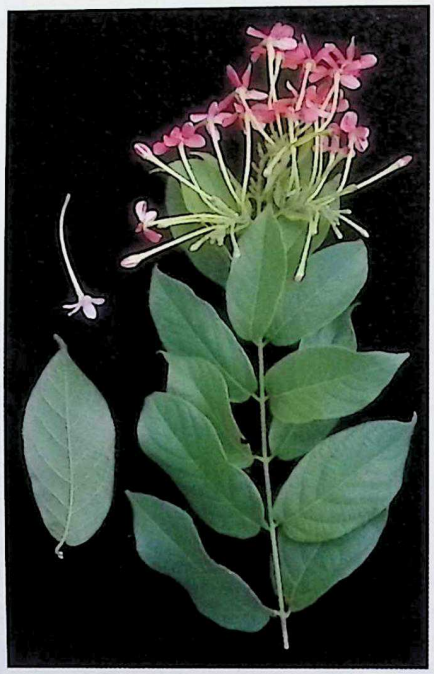
Distribution and habitat

Probably indigenous in both tropical Africa and tropical Indo-Malaysia. Cultivated in gardens throughout India, up to an altitude of 300 m.

Medicinal properties and uses

The fruits, seeds and extracts from both the roots and leaves possess anthelmintic properties. The fruits are picked when half ripe and bitter, pulped in water and the water is taken internally. The sweet ripe seeds also possess soporific properties; they must be taken in strict moderation (no more than 4 per dose), as an overdose can lead to unconsciousness. In China, they are roasted and given to treat diarrhoea and fever, and in Indochina are used to treat rickets in children. Macerated in oil, the seeds are used as an external application to treat parasitic skin diseases. An oil extracted from the seeds possesses purgative properties. The juice of leaves is used in Malaysia as a lotion to relieve boils and ulcers. In Indonesia, very young shoots are eaten raw or steamed as a vegetable.



References

Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

Terminalia alata Heyne ex Roth

Botanical synonyms

Terminalia coriacea (Roxb.) Wight & Arn., *T. macrocarpa* Steud., *T. tomentosa* (Roxb.) Wight & Arn.

Common names

Bengali: asan, piasal, usan; ***English***: black murdah, Indian laurel; ***Gujarati***: ain, hadri, sadada, sadar, sadra, sadri, sajadio; ***Hindi***: asan, ashan, sain, saj; ***Kannada***: aini, banapu sajad, karimaddi, karimatti, madati, matti; ***Konkani***: assan, mart, marti; ***Malayalam***: karimarudu, karimaruthu, thembava, thenpavu; ***Marathi***: ain, madal, sadada, saj; ***Oriya***: kolashahajo, pondosahajo, sahajo; ***Punjabi***: aisan, arjan, asan, sain; ***Sanskrit***: arjuna, asana; ***Tamil***: anemui, karimarudu, karumaruthu, karuppumarudu, mikkuvam, pudavam; ***Telegu***: inumaddi, maddi, mala-maddinumaddi, nelamadu, tani.

Description

A large, deciduous, straight-stemmed tree with spreading branches and a heavy

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crown; bark grey to black, with deep longitudinal fissures and transverse cracks; young twigs often clothed with yellowish-brown pubescence. Leaves subopposite, thinly coriaceous, pubescent beneath, elliptic-lanceolate or ovate, 13–23 cm long and about 8 cm wide, acute at apex, truncate-cordate at base, main nerves 8–12 pairs, prominent beneath; 1–2 glands near the base. Flowers dull yellow or greenish-white, borne in terminal and axillary branched spikes; bracteoles linear; calyx villous with yellowish-brown hairs. Fruits 3.8–6.5 cm long, with 5 broad, coriaceous, equal, horizontally-veined wings. Flowers in June and July and fruits from February to March in central India; in this region trees remain leafless between February–March and June.

Distribution and habitat

Native to India, Myanmar (Burma), Indochina and Thailand. It is one of the most common and widely distributed timber species in India, common in tropical moist and dry deciduous forests throughout the country to an elevation of 1200 m, except in the very arid regions of Punjab and Rajasthan. It is commonly associated with sal (*Shorea robusta*) and teak (*Tectona grandis*) in their respective zones.

Medicinal properties and uses

The bark is considered to be bitter, styptic, diuretic and cardiotonic. A decoction of the bark is taken internally for atonic diarrhoea and is used as a local application for relief of weak, indolent ulcers. In Ayurveda, the bark is also used to treat bone fractures, haemorrhages and bronchitis. The cut bark exudes a gel-like fluid that dries to a light-yellow to amber-coloured gum, which is used as a purgative (and adhesive). In Siddha the bark, gum and leaves are reportedly used to treat fever and earache.

References

Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

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Terminalia arjuna (Roxb.) Wight & Arn.

Botanical synonyms

Pentaptera arjuna Roxb. ex DC., *Terminalia berryi* Wight & Arn.

Common names

Bengali: arjhan, arjun; ***English***: arjun, white murdah; ***Gujarati***: arjunasadara, dhaulasadr, sadado; ***Hindi***: arjun, arjuna, kahu, koha, kohwa; ***Kannada***: bilumoddi-nirmathi, holamatti, maddi, thosamatti; ***Konkani***: arjun, holematti, nadiain; ***Malayalam***: attumarutu, kattukadukka, nir-maruthu, vellamarutu, vellilaya; ***Marathi***: anjan, arjuna, anmadat, sadaru, savimadat, vellamarda; ***Oriya***: arjuna, arjuno, kaha, khaua, pandasahajo, porjonyasahajo; ***Punjabi***: arjan, jumla; ***Sanskrit***: arjuna, arjunah, kakubha, kukubha; ***Tamil***: kola-marutha, marudu, nirmatti, vellaimaruthu, vellamatta, vellamonda; ***Telegu***: erumaddi, tellamaddi, tittumaddi, yermaddi, yerra-maddi; ***Urdu***: arjan.

Description

A usually evergreen tree 15–25 m tall with a spreading crown, drooping branches, and buttressed, often fluted stem; bark very thick, grey or pinkish-green, smooth, peeling off in large, thin, irregular sheets; young twigs smooth or with yellowish-brown hairs. Leaves subopposite, elliptic-lanceolate or elliptic-oblong, coriaceous, pale dull green above, pale brown beneath, 7.5–17.5 cm long and 2.5–5.5 cm wide, shortly acute or obtusely acuminate at the apex, rounded or cuneate at the base, margins slightly crenate-serrate; main nerves 12–18 pairs; petiole 3–10 mm long, usually with 1–2 prominent glands at the the top, below the leaf blade. Flowers sessile, yellowish-white, borne in short axillary spikes or in terminal panicles 9–13 cm long; bracteoles linear-lanceolate, shorter than the flowers, caducous; calyx glabrous, teeth triangular. Fruits ovoid-oblong, 3–6 cm long and 1.8–2.8 cm wide, nearly glabrous, with 5–7 hard, winged angles, usually notched at top. In central India, flowering occurs between April and June; fruits mature the following February–April; in dry habitats, the tree may be leafless for a short period between March and May.

Distribution and habitat

Native to peninsular India and Sri Lanka; common along rivers, streams, ravines and dry watercourses in grassland and forested areas.

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Medicinal properties and uses

The bark is acrid and sweet, and credited with alexiteric, styptic, tonic, febrifugal and antidysenteric properties. In Ayurveda, the bark is used in the treatment of polyuria, cardiac diseases, blood diseases, chronic fever, fractures, obesity and skin diseases. In Unani medicine the bark is considered bitter, expectorant, aphrodisiac, tonic and diuretic, and is used internally for biliousness, externally for treating wounds and fractures, and both internally and externally for treating gleet and urinary discharges. In Siddha, the bark, leaf and fruit are used for treating diabetes mellitus, leucorrhoea, cardiac diseases, leprosy, worm infestation, abdominal disorders and ulcers. The powdered bark reportedly gives relief in cases of symptomatic hypertension and acts as a diuretic and general tonic in cases of cirrhosis of the liver. The powdered bark, taken with milk, is used to treat bone fractures and contusions. Among the tribal inhabitants of Surguja District in northeastern Madhya Pradesh, the powdered bark is taken with water to treat gastric troubles, and the juice of the leaves or bark is prescribed for treating high blood pressure. A decoction of the bark is used as a wash for ulcers and taken internally as a febrifuge. Ashes of the bark are sometimes prescribed to treat scorpion sting. The fruit is tonic and deobstruent. The juice of the fresh leaves is used to treat earache.

References

Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935), Kumar and Jain (1998), Vijaya Kumar and Pullaiah (1998), Viswanathan (1997), Yoganarasimhan (1996).

Terminalia bellirica (Gaertn.) Roxb.

Botanical synonyms

Myrobalanus bellirica Gaertn., *Terminalia bellirica* var. *laurinoides* Cl.

Common names

Bengali: bahera, bahira, bhairah, boira; ***English***: bedda nut tree, belliric myrobalan (fruits); ***Gujarati***: behada, behedamunjhad, bahedo, behaza, behedan, bero; ***Hindi***: bahera, behada, behera, bhaira, bharla, sagona; ***Kannada***: santi, tari, thani, thare, tharo, vibhita, vibhitaka; ***Konkani***: gotting, gutting; ***Malayalam***: tanni, thani, tusham; ***Marathi***: bahera, baira, balra, beheda, bhirda, sagwan, vavara, yehelabehada; ***Oriya***: bahada, bhara, thara; ***Punjabi***: bahera, birha; ***Sanskrit***: aska, bahira, bibhitaka, vibhitaka, vibhitaki; ***Tamil***: akkam, kattuelupay, tani, tanri, thandi, thandri, thani, vibidagam; ***Telegu***: bhutavasamu, tandra, tani, thadi, thadra, vibhitakamu; ***Urdu***: behera.

Description

A medium-sized to large tree up to 40 m tall, with a straight stem, sometimes buttressed when large; bark bluish-grey, with many fine vertical cracks; young branches

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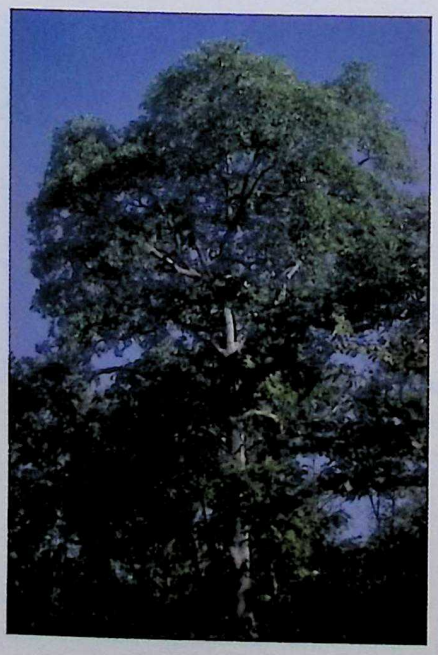
and young leaves appressed rufous-pubescent. Leaves simple, clustered or sometimes spirally arranged or whorled at the ends of branches, coriaceous, broadly elliptic to elliptic-obovate, 10–20 cm long and 4–15 cm wide, broadly rounded at base, rounded to emarginate at apex, margins entire; main nerves 6–8 pairs, spreading, prominent; petiole 2.5–10 cm long, without glands at apex. Flowers pale greenish-yellow or creamy-white with an offensive odour, borne on solitary, simple axillary spikes 7–11 cm long, those in the upper part of the spike male and very shortly pedicelled, those in the lower part hermaphrodite, sessile; bract linear, early caducous; calyx pubescent outside, woolly inside with long brown hairs, teeth broadly triangular, acute. Fruits broadly ellipsoid to subglobose, 2.5–3 cm long and 1.5–2.5 cm in diameter, grey, obscurely longitudinally 5–6-ridged, densely fine yellow- or brown-pubescent. Flowers from March to May in peninsular India; fruits mature between January and April of the following year. In central Indian deciduous forests, trees remain leafless from February–March to April–May.



Distribution and habitat

Native to India, Bangladesh, Myanmar (Burma), Sri Lanka, Thailand and Malaysia. Common in deciduous to semi-evergreen forests throughout most of India to an elevation of about 900 m, usually scattered (not gregarious) in moist valleys.

Medicinal properties and uses

In Ayurveda the fruit is considered to be laxative and anthelmintic; it is used to treat bronchitis, sore throat, biliousness, inflammations, strangury, asthma and diseases of the eye, nose, heart and bladder. The ripe fruit is used as an astringent, usually in combination with *chebulic myrobalan* (from the fruits of *Terminalia chebula*) and those of *Phyllanthus emblica* (*Euphorbiaceae*), to form *Triphala* ('three fruits'), a well-known Ayurvedic drug prescribed for a variety of diseases. When half ripe, it is

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used as a purgative, due to the presence of an oil with properties similar to those of castor oil (from *Ricinus communis*: *Euphorbiaceae*). Mixed with honey, the pulp is used in an application to treat ophthalmia. The fruit pulp is used in Punjab to treat dropsy, piles, diarrhoea and leprosy. The fruit peel is reportedly chewed to relieve coughs and colds by the Garasias in Rajasthan. The oil obtained from the fruits is used as a hair oil and as an external application for rheumatism. In southern Orissa, the ash of the burnt fruits is taken with rock salt to treat diarrhoea. The seed kernels possess narcotic properties. In Konkan (coastal districts of Maharashtra), it is sometimes eaten with betel-nut (*Areca catechu*: *Arecaceae*) and betel leaf (*Piper betle*: *Piperaceae*) for treatment of dyspepsia. In Siddha, the fruit, leaf and seed are variously used to treat guinea-worm infestation, leucorrhoea, venereal diseases, hypertension, pox and dyspnoea. The bark is used as a diuretic, and the gum as a demulcent and purgative. Known commercially as *belleric myrobalan*, the fruit pulp is also used for tanning and the seed oil for soap manufacturing.

References

Chopra *et al.* (1956, 1969), CSIR (1948–1992), Joshi (1989), Kirtikar *et al.* (1935), Mohanty *et al.* (1996), Sivarajan and Balachandran (1994), Yoganarasimhan (1996).

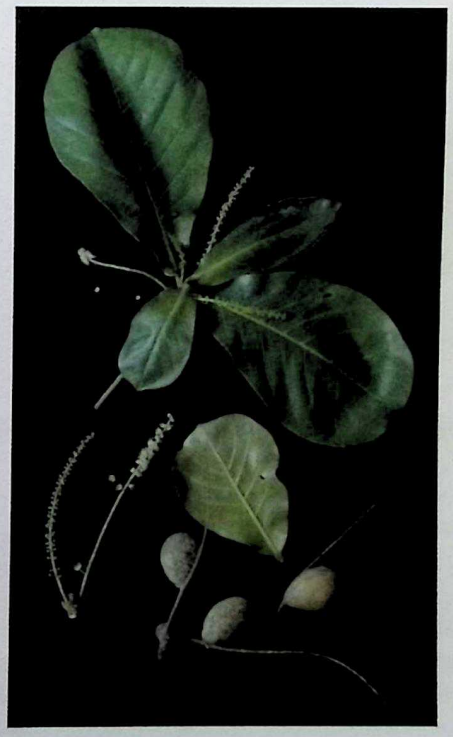
Terminalia catappa L.

Botanical synonyms

Terminalia mauritiana Blanco, *T. moluccana* Lam., *T. procera* Roxb.

Common names

Bengali: badam, banglabadam, deshibadam; ***English***: Indian almond tree; ***Gujarati***: badamali, deshibadam, lilibadam; ***Hindi***: badami, deshibadam, janglibadam, pattibadam; ***Kannada***: adamaram, badami, kadubadami, natubadami, olegra, urubadami; ***Malayalam***: adamarram, badam, nattubadam; ***Marathi***: bengalibadam, janglibadama, natbadam; ***Oriya***: badambo, bodamo, desiyobadamo; ***Sanskrit***: ingudi; ***Tamil***: nattuvadumai, siruppinga, vathakottai natavadom; ***Telegu***: badam, badami, badamuchettu, vedam.



Description

An evergreen or briefly deciduous tree (depending on locality) 10–35 m tall, with smooth grey bark and whorled branches; young branches densely yellow-brown pubescent. Leaves 13–22 cm long and 7–12 cm wide, spirally arranged or clustered at the ends of branches, obovate or elliptic-ovate, narrowing below the middle into a narrow subcordate base bearing one dark-coloured, sessile gland on each side of the midrib, finely tomentose when young, becoming somewhat glossy when mature; veins 9–11 pairs; petioles 0.5–1 cm long;

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bracts ovate, 0.5–0.6 mm long. Flowers sessile, white, in axillary spikes 5–14 cm long with a predominance of male flowers and a few female or hermaphrodite flowers usually only at the base; bracts minute; calyx-teeth glabrous or nearly so within and without. Fruit 3.5–5.5 cm long and 2.5 cm or more wide, ellipsoid or ovoid, laterally more or less compressed, often ringed by a rigid wing 2 mm broad.

Distribution and habitat

Native to coastal forests on sandy soils from India through Indochina and Thailand, throughout the Malesian area to northern Australia and Polynesia. Cultivated in many parts of tropical India and in many other tropical countries worldwide as an ornamental tree and for its fruits.

Medicinal properties and uses

In Ayurveda the fruit is considered cooling, aphrodisiac and astringent to the bowels; it is used to treat biliousness and bronchitis. The seed is edible and contains an oil which is used medicinally for true almond oil. The leaves act as a sudorific and are applied to relieve rheumatic joint pain. The juice of the young leaves is used in southern India to prepare an ointment for treating scabies, leprosy and other skin diseases; taken internally, it is said to be useful for treating colic and headache. The tannin from the leaves and bark is used as an astringent for treating dysentery, it is regarded as diuretic and cardiotonic, and is applied externally on skin eruptions. The bark and leaves, and sometimes the roots and green fruits, are used for tanning leather, dyeing cloth, and for making ink.

References

Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

Terminalia chebula Retz.

Botanical synonym

Myrobalanus chebula (Retz.) Gaertn.

Common names

Bengali: haritaki; ***English***: black myrobalan, chebulic myrobalan, gall nut; ***Gujarati***: hardo, haridi, hirde, hirdo; ***Hindi***: har, harir, haritaki, harra, pilzari; ***Kannada***: alale, anile, aralaikai, arale, halle, harade, haritaki, herrda; ***Konkani***: ordo; ***Malayalam***: kaddukukka, katukka, pulicakku, putanam; ***Marathi***: habra, hilda, hirda; ***Oriya***: haredha, harida, haridra, horitoki, jonghihorida, karedha; ***Punjabi***: halela, har, harar, hurh; ***Sanskrit***: abhaya, haritaki, pathya; ***Tamil***: illagucam, kadakai, kadukkai; ***Telegu***: karaka, karakkai, karitaki; ***Urdu***: haejarad.

Description

A semi-deciduous tree up to 24 m tall (though usually much smaller in peninsular India) with a cylindrical bole, a rounded crown and spreading branches. Bark dark brown, often longitudinally cracked, exfoliating in woody scales; young parts of twigs clothed in silky hairs. Leaves alternate or subopposite, 5–16 cm long and

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2.5–5.5 cm wide, ovate-lanceolate to broadly elliptic, obtuse to rounded at apex, rounded to subtruncate or occasionally oblique and unequal at base; veins 5–8 pairs; petiole 0.8–1.8 cm long with a pair of large glands at the apex; bracts 3.5 long, linear, acute, pubescent on both surfaces. Flowers all hermaphrodite, 4 mm across, sessile, dull white to pale yellow with an offensive smell, borne in simple or branched axillary or terminal spikes 3–5 cm long; bracts exceeding the flowers, subulate or lanceolate, hairy, conspicuous among the buds but soon deciduous; calyx campanulate, 3 mm long, teeth 5, short. Fruits elliptic-ovoid, 2–4 cm long and 1.3–2.1 cm wide, broadly ellipsoid to subglobular, obscurely 5–10-ridged, glabrous, yellow to orange-brown when ripe; stone oblong, bony, very thick, obscurely angled. In central India, where trees are leafless for a short period between February and April, flowering occurs between April and August and fruiting from November to February; in Karnataka, flowering and fruiting occurs from January to September.

Distribution and habitat

Native to Myanmar (Burma), Sri Lanka, Thailand and the Malay peninsula. Very common in sub-Himalayan hill forests from the Ravi eastwards to West Bengal and Assam to an elevation of 1500 m, and in open deciduous hill forests of peninsular India from northern Maharashtra and Madhya Pradesh, typically on yellow soils overlying laterite, sandstone and metamorphic rocks, to Tamilnadu and Kerala.

Medicinal properties and uses

The fruits are widely used in Ayurvedic, Unani and other traditional systems of medicine. They are credited with laxative, digestive, carminative, stomachic, tonic, expectorant, anthelmintic, antidysenteric and alterative properties. In Ayurveda they are used to promote healing of wounds, ulcers and swellings, to treat skin and eye diseases, diabetes, chronic and recurrent fever, anaemia, cardiac disorders, diarrhoea, dysentery, cough and dyspnoea; they are also found in combination with other ingredients in numerous Ayurvedic preparations for treating a wide variety of conditions and diseases. The ripe fruit is used as an astringent, usually in combination with the fruits of both *Terminalia bellirica* (*belliric myrobalan*) and *Phyllanthus emblica* (*Euphorbiaceae*), which together comprise *Triphala*, a well-known Ayurvedic drug. The unripe fruits are used in Unani medicine to treat dysentery and diarrhoea, and the ripe fruits for treating ophthalmia, diseases of the spleen, and piles. The fruit pulp is used as a dentifrice to cure bleeding gums, as a gargle for stomatitis, and as a local application to promote

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healing of chronic ulcers and wounds. Water in which the fruits have been steeped overnight is used as a cooling eye-wash to relieve conjunctivitis. In southern Orissa, a paste prepared from the pericarp of the fruit is taken with curd (yoghurt) to relieve diarrhoea. When coarsely powdered and smoked in a pipe, the fruit reportedly relieves asthma. A fine paste of the fruit with carron oil promotes healing of burns and scalds. Among the tribal inhabitants of Surguja District in northeastern Madhya Pradesh, the unripe roasted fruits and boiled seeds are chewed to relieve coughs, and the juice of the stem bark is given to relieve stomach pain. The bark has both diuretic and cardiotonic properties. A decoction of the stem bark is used as a disinfectant wash for wounds among the Kondhs of southwestern Orissa.

References

Chopra *et al.* (1956), CSIR (1948–1992), Girach (1992), Kirtikar *et al.* (1935), Kumar and Jain (1998), Mohanty *et al.* (1996), Sivarajan and Balachandran (1994), Verma *et al.* (1995), Yoganarasimhan (1996).

Terminalia paniculata Roth

Common names

English: flowering murdah; ***Kannada***: honagalu, honalu, hulive, maruva, mathi, ulvi; ***Konkani***: quinzol; ***Malayalam***: marutu, pemarutu, pillamurda, pullamarutu, pumarutu, vellamarudu, vemmarutu; ***Marathi***: kindal, kinjal, kirijul; ***Sanskrit***: asvakarnah; ***Tamil***: marudu, pekadukkai, pekarakai, pumarudu, vedamarudu, venmaruthu; ***Telegu***: nallaputaga, neemeeri, pulamaddi, puligi, putanallamanu.

Description

A large deciduous tree with rough, dark brown bark; young parts rusty-tomentose. Leaves subopposite or upper ones alternate, 10–24 cm long and 4–8 cm wide, elliptic-oblong, apex acute or acuminate, pale brown and finely reticulately veined beneath, usually with sessile glands near the base of the midrib, base cordate or rounded, often unequal; main nerves 10–15 pairs, parallel; petioles 12–15 mm long, pubescent; bracts pubescent, acuminate. Flowers white, borne on branched spikes; calyx reddish-brown, cup-shaped, clothed with long brown hairs inside. Fruit 6–12 mm long, sessile, rusty-tomentose, unequally 3-winged, with middle wing broader (18–25 mm) than laterals (*c.* 3 mm).

Distribution and habitat

Found in tropical semi-evergreen and moist deciduous forests of the Western Ghats from Maharashtra to Kerala and western Tamilnadu up to 1200 m elevation and in interior districts of Karnataka. It is particularly common in deciduous forests of Kerala to an elevation of 600 m. Requires well-drained soils and is most frequently found in valleys and on lower hill slopes.

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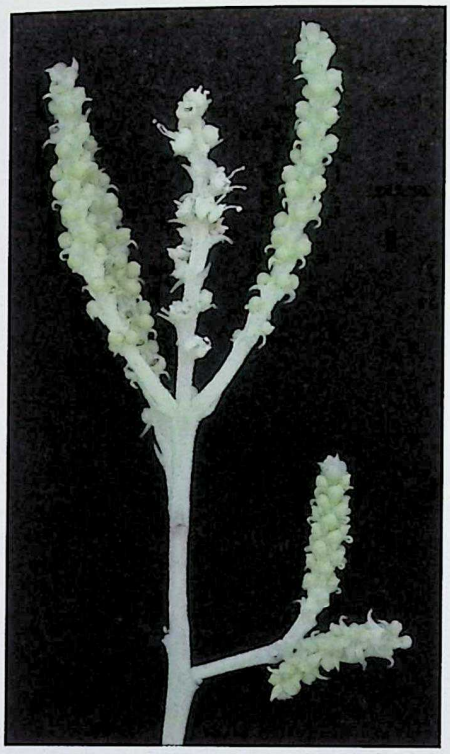

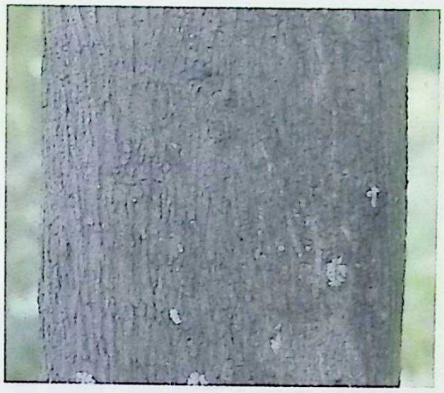

Medicinal properties and uses

The bark is credited with diuretic and cardiotonic properties. The juice of the bark is applied with clarified butter (*ghee*) and rock-salt in the treatment of parotitis. The juice of the fresh flowers, rubbed with the root of *Cocculus hirsutus* (*Menispermaceae*), is reportedly used as a remedy for cholera and an antidote for opium poisoning. Both the bark and fruit contain tannins, which are used for dyeing and tanning. The tree is also valued for its timber.

References

Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

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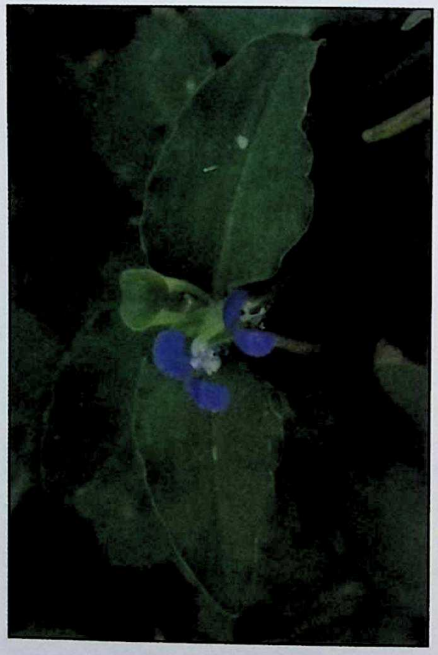
Commelinaceae

Commelina benghalensis L.

Common names

Bengali: kachradam, kanchara; ***Gujarati***: mhotunshushmuliyun; ***Hindi***: kanchara; ***Kannada***: hittagani; ***Marathi***: kena; ***Punjabi***: chura, kanna; ***Sanskrit***: kancata, kanchata; ***Tamil***: adutinnathalai, kanangakarai, kanavazhai; ***Telegu***: nirukassuvu, vennadevikura.



Description

A creeping or procumbent herb with 60–90-cm-long, dichotomously branched stems and diffuse branches, often rooting at nodes. Leaves 2.5–7.5 cm long and 1.3–3.8 cm wide, ovate or oblong, apex obtuse, base unequal-sided, rounded, cuneate or cordate, sessile or short-petioled, pubescent or villous on both surfaces; nerves 7–11 pairs. Spathes 1–3 together, funnel-shaped, auricled on one side, pubescent or hirsute; flowers blue, borne in branched cymes; sepals small, oblong, pubescent; larger petals orbicular or transversely oblong. Fruits (capsules) 0.6 cm long, pyriform, membranous, 5-seeded; seeds oblong, closely pitted.

Distribution and habitat

Found in moist habitats throughout tropical and subtropical India, Sri Lanka, Southeast Asia and Africa.

Medicinal properties and uses

The plant is considered bitter, demulcent, emollient, laxative and cooling. In Ayurveda, the whole plant is used for treating leprosy and haemorrhage. In Siddha, the whole plant is used to treat haemorrhage, dysuria, fever and mastitis. Among the Paharia and Santhalis in eastern Bihar, an extract of the fresh leaves is applied externally to treat skin infections caused by the fungus *Tinea pedis*. On the island of

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Réunion, it is reportedly used in the form of a decoction as an emollient lotion or bath.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956), Kirtikar *et al.* (1935), Kumar and Goel (1998), Yoganarasimhan (1996).

Cyanotis axillaris Roem. & Schult. f.

Botanical synonym

Tradescantia axillaris Roxb.

Common names

Hindi: baghanulla, soltraj; ***Marathi***: itsaka; ***Tamil***: nirpulli; ***Telegu***: golagandi, gollagundi.

Description

A creeping or suberect, diffusely branching annual herb with fibrous roots; branches glabrous or sparsely hairy, often coloured, internodes 2.5–7.5 cm long. Leaves sessile, 5–15 cm long and 0.4–0.8 cm wide, narrowly linear or linear-lanceolate, apex acute or acuminate, glabrous or more or less hairy; sheaths 6–10 mm long, inflated, ciliate. Flowers violet-blue, clustered in the inflated sheaths; sepals 10 mm long, spathulate-lanceolate, acuminate, sparsely hairy; corolla tube 8 mm long, corolla lobes broadly ovate. Fruits (capsules) about 0.6 cm long, oblong-ellipsoid, beaked; seeds 2.5 mm long, oblong, mottled, dark brown, shining.

Distribution and habitat

Found throughout India in the plains from the upper Gangetic valley to Assam southwards through peninsular India from sea level to an elevation of 1500 m; also occurs

in Sri Lanka, West Asia and tropical Australia.

Medicinal properties and uses

The plant is used, usually mixed with oil, as an external application to treat ascites; it is reportedly used as a remedy for tympanites in the Malabar coast region (Kerala and Karnataka).

References

Chopra *et al.* (1956), Kirtikar *et al.* (1935).

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Convolvulaceae

Argyreia cuneata (Willd.) Ker-Gawler

Botanical synonyms

Convolvulus cuneatus Willd., *Lettsomia cuneata* Roxb., *Rivea cuneata* Wight

Common names

English: purple convolvulus; ***Kannada***: achhegide, attarigidda, kalkukagidda, kallana hambu; ***Marathi***: bondwail, mahulungi.

Description

A climbing or shrubby plant up to about 1.5 m tall. Leaves elliptic or obovate, obtuse, sometimes emarginate, 3.6–10 cm long and 0.9–4.2 cm wide, short-petioled, hairy beneath. Flowers deep bright purple, borne in axillary, 1–6-flowered peduncled cymes. Fruits (berries) ellipsoid, yellow-brown when ripe, about 2.7 cm long.

Distribution and habitat

Found in the upper hills of peninsular India between 950 and 1400 m; cultivated in gardens from Maharashtra southwards.

Medicinal properties and uses

Among the Gonds of Uttar Pradesh, the root extract along with the root of *Marsdenia tenacissima* (*Asclepiadaceae*) is taken internally for the treatment of arthritis.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956), CSIR (1948–1992), Singh and Prakash (1994), Yoganarasimhan (1996).

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Argyreia nervosa (Burm. f.) Bojer

Botanical synonyms

Argyreia speciosa (L. f.) Sweet, *Convolvulus speciosa* L., *C. speciosus* L. f., *C. nervosus* Burm. f., *Ipomoea speciosa* (L. f.) Pers., *Lettsomia nervosa* (Burm.f.) Roxb., *Rivea nervosa* (Burm. f.) Hall. f.

Common names

Bengali: bichtarak, bijtarhak, bijtarka, guguli; ***English***: elephant creeper, woolly morning glory; ***Gujarati***: samudrashok, samudrasoka, vargharo; ***Hindi***: samandarkapat, samandarkaphal, samandarsokh, samundrasokh; ***Kannada***: chandrapada, samudraballi, samudrahaale; ***Malayalam***: samudrapala; ***Marathi***: samudrasoka, samudrashok; ***Oriya***: bryddhotareko, monda; ***Sanskrit***: ajantri, dridhadaru, hastivalli, murva, samudrapalaka, vriddhadaraka, vriddhadaru; ***Tamil***: kadal-pala, samuddirapacchai; ***Telegu***: chandrapada, kokkita, samudrapala; ***Urdu***: samandarsotha.

Description

An extensive woody climber with a stout stem; young shoots and branches covered by a silky white pubescence. Leaves ovate-cordate, apiculate at tip, 7.5–30 cm in diameter, glabrous above, white tomentose (velvety) beneath. Flowers rose-purple with 7.5–30-cm-long white-tomentose peduncles, borne in axillary many-flowered cymes; bracts ovate-lanceolate, acuminate, 3–4 cm long. Fruits (berries) globose, 2 cm in diameter, apiculate, indehiscent. Flowers from August to September and fruits from October to December in central India.

Distribution and habitat

Native to India from Assam and Bengal southwards to Karnataka and Tamilnadu to an elevation of 900 m on the eastern slopes of the Western Ghats; sometimes cultivated in India and other tropical countries. It is typically found on riverbanks and at edges of lakes, and in the understorey of forests over bushes; uncommon in dry western regions.

Medicinal properties and uses

In traditional Indian medicine the whole plant is prescribed for treating gleet, gonorrhoea, strangury and chronic ulcers. The leaves are emollient (upper surface) and vesicant (lower surface), and are used externally to treat itching, boils, wounds, ringworm, eczema and other skin diseases, and internally to cure boils and swellings. The leaves are also used as a local stimulant and rubifacient. The seeds, mixed with those of *Hygrophila auriculata* and *H. spinosa* (*Acanthaceae*), are used as a tonic; the seeds also have a marked hypotensive and spasmolytic effect. The root is considered bitter, aphrodisiac and diuretic; it is used as a tonic and to treat gonorrhoea, rheumatism and diseases of the nervous system; in Kerala it is used by some Ayurvedic physicians as the source of *Murva*, used to treat urinary, heart and skin diseases and intermittent fevers. It is an ingredient of a compound drug known as *Ajmadadi churna*, used for treating hemiplegia and rheumatism. A paste of the roots, mixed with those of *Asparagus racemosus* (*Asparagaceae*), *Grewia hirsuta* (*Tiliaceae*) and *Hemidesmus indicus* (*Asclepiadaceae*),

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are used to treat chronic cough and cold and related fever. The root, ground in rice water, is used as an external application to the head to treat migraine among the Rabari in the Barda Hills of Gujarat. A preparation known as *Fortege*, prepared from this plant and several other ingredients, is used for treating common male sexual disorders.

References

Asolkar *et al.* (1992), Chatterjee and Pakrashi (1995), Chopra *et al.* (1956), CSIR (1948–1992), Jadeja (1999), Kirtikar *et al.* (1935), Sivarajan and Balachandran (1994), Upadhye *et al.* (1994), Vijaya Kumar and Pullaiah (1998), Yoganarasimhan (1996).

Convolvulus arvensis L.

Common names

Bengali: gandhbhadali, gondal; ***English***: bindweed; ***Gujarati***: nari, veladi; ***Hindi***: beri, hiran khuri, hiranpadi, lapetani, prasarna; ***Kannada***: narangi balli; ***Marathi***: chandvel, hiranpag; ***Punjabi***: harinpadi, hiranpaddi; ***Sanskrit***: bhadrabala, prosarani, rajbala, sarana.

Description

A trailing or twining herb with a creeping rootstock. Leaves alternate, 2.5–6.5 cm long, variable in breadth, ovate or oblong, usually glabrous, obtuse or apiculate at apex, auriculate or hastate at the base, lower leaves often lobed; petioles 0.6–2 cm long. Flowers white or pink, axillary, solitary; peduncles 2.5–5 cm long, slender with a pair of small linear bracts at the apex from which the pedicels arise; pedicels 3–25 mm long; sepals 5–6 mm long, broadly elliptic, obtuse or truncate, unequal, glabrous; corolla up to 2 cm long. Fruits (capsules) 6–8 mm in diameter, globose, glabrous; seeds subtrigonous, dark reddish-brown, glabrous or puberulous. Flowers and fruits between December and March in central Indian deciduous forest regions.

Distribution and habitat

A common plant with a wide pantropical and subtropical distribution. In India it occurs as a weed in cultivated areas throughout the country to an elevation of about 3000 m in the Himalayas.

Medicinal properties and uses

The roots are used as a purgative.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

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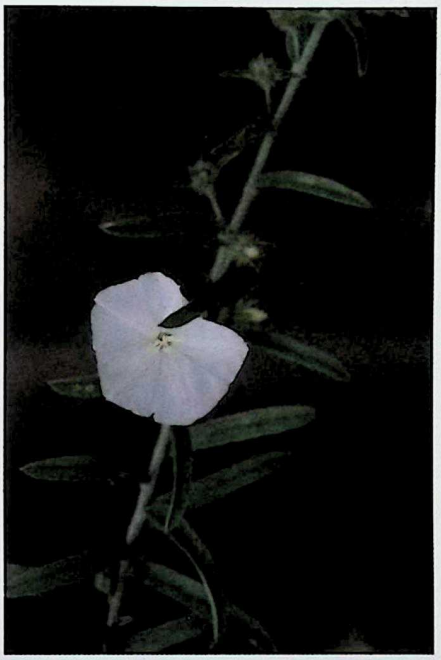
Convolvulus pluricaulis Choisy



Botanical synonym

Convolvulus microphyllus Sieb. ex Spreng.

Common names

Bengali: dankuni; ***Hindi***: shankahuki, shankapushpi; ***Punjabi***: dodak, porprang; ***Sanskrit***: sankhapushpi, sankhapuspi.

Description

A slender, procumbent or suberect herb up to 50 cm long with a woody rootstock. Leaves 1.2–2.5 cm long, linear-oblong or the upper elliptic, apex obtuse, mucronate, base tapering, villous on both sides, leaf margins slightly hairy, short-petioled. Flowers axillary or on short lateral branches, sessile or short-pedicelled, 1–3 together; bracts beneath the calyx linear-lanceolate, hairy, 3 mm long; sepals 0.6 cm long, ovate-lanceolate or linear-lanceolate, sparsely hairy; corolla wide, funnel-shaped, pale rose or rose-yellow. Fruit an ellipsoid or globose capsule, 0.3 cm long, smooth. Flowering occurs in October in west-central India.

Distribution and habitat

A common weed found in cultivated fields throughout most of India.

Medicinal properties and uses

In northern Indian Ayurvedic practice, this species is considered the source of the drug *Shankapuspi*, which is more commonly equated with *Clitoria terneata* (*Fabaceae-Papilionoideae*) in southern India, the whole plant being used in a number of formulations as a nervine tonic for improvement of memory and intellect. The leaves and flowers reportedly possess hypotensive properties and are useful as a sedative in treating anxiety neurosis. Both the leaves and flowers also possess antifungal properties.

References

Asolkar *et al.* (1992), Chopra *et al.* (1969), Dey (1980), Sivarajan and Balachandran (1994).

Cuscuta reflexa Roxb.

Botanical synonym

Cuscuta santapaui Banerji & Das

Common names

Bengali: algusi, swarnalata; ***English***: dodder; ***Gujarati***: amarabel; ***Hindi***: akashabela, akashbel, amarbel, kashavela; ***Kannada***: badanike; ***Marathi***: amarvela, nirmuli, nirmuliakashavela; ***Oriya***: kolanirmuli, nirmuli; ***Punjabi***: amil, nilathari, niradhar, zarbuti; ***Sanskrit***: akasavalli, amaravela, khavalli; ***Tamil***: kodiyagundal, sadadari; ***Telegu***: lanjasavaramu, savarapukada, sitam-

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mapogunalu, sitasavaramu; ***Urdu***: akasha-bel, imalbel.

Description

A parasitic climber with yellowish-green stems up to 2.5 mm in diameter, sometimes completely covering bushes and tree crowns. Leaves reduced to minute scales. Flowers small, white or pinkish, solitary or in clusters or in short racemes, with small, fleshy, subquadrate bracts; corolla campanulate, 0.6–1 cm long. Unripe fruits (capsules) depressed-globose, fleshy, 0.6 cm in diameter, acute, with black marks or warts; seeds black. Flowers from October to January and fruits from December to February; plant dies down during the dry, hot season.

Distribution and habitat

Native to the Indo-Malaysia region from Afghanistan through India, Sri Lanka, southern China, Thailand and Malaysia, common throughout most of India to an elevation of about 2500 m as a parasite on a variety of tree and shrub species grown on roadsides and in villages.

Medicinal properties and uses

The whole plant and seeds are widely used in traditional Indian medicine. In Ayurveda the plant is considered aphrodisiac, alterative and tonic, and is used to treat eye and heart diseases. The seeds are used as a demulcent, diaphoretic and tonic; their cold infusion is considered carminative and depurative. In Unani medicine, the herb is considered expectorant, carminative, tonic, anthelmintic, purgative, diaphoretic and diuretic, and is used to treat jaundice, muscle and joint pains, headache, paralysis, diseases of the spleen, vomiting and lumbago; the seeds are used in Unani practice to treat liver and spleen diseases and fevers, their infusion for ophthalmia and their decoction for biliousness and as a purgative. The aqueous extract of the plant crushed with black pepper is taken orally in the treatment of spermatorrhoea. The stem is a purgative, its decoction used to relieve bilious affections; it is also applied externally for treating skin diseases. Plant extracts are used externally to relieve itches, and internally for relief of protracted fever, flatulence, diphtheria,

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liver disorders, and to expel hookworms. An infusion of the plant is used for washing ulcers and to relieve dermatitis. The fruits are used to treat cough and fever. The plant is used in combination with other plant drugs, namely *Centella asiatica* (*Apiaceae*), the fruit of *Vitex penduncularis* (*Lamiaceae*), and black pepper, as a contraceptive among Kondh women in southwestern Orissa. A paste of the plant is applied to promote healing of tongue ulcers by the tribal inhabitants of southern Bihar.

References

Asolkar *et al.* (1992), Chatterjee porprang, Pakrashi (1995), Chopra *et al.* (1956, 1969), Girach (1992), Girach porprang, Aminuddin (1995), Katewa porprang, Arora (1997), Kirtikar *et al.* (1935), Sahoo porprang, Mudgal (1995), Yoganarasimhan (1996).

Evolvulus alsinoides (L.) L.

Botanical synonym

Convolvulus alsinoides L.

Common names

Bengali: vishnugandhi; ***Gujarati***: jhinkiphudardi, kalisankhavli, kalishankhavali; ***Hindi***: sankhapushpi, shankapuspi, shyamakranta, vishnukranta; ***Kannada***: shankhapushpi, vishnukranti; ***Malayalam***: vishnukranthi, vistnaclandi; ***Marathi***: shankha valli, vishnukranta; ***Punjabi***: sankhpushpi; ***Sanskrit***: vishnugandhi, vishnukranta; ***Tamil***: vishnukarandi, vishnukrendi; ***Telegu***: vishnukaranta, vishukrantha.

Description

A prostrate, annual or perennial herb with spreading, wiry, silky hairy branches arising from a woody rootstock and many spreading branches. Leaves alternate, subsessile to short-petioled, variable in shape: broadly ovate, elliptic or lanceolate, 0.8–2.6 cm long and up to 1 cm wide, acute to rounded at both ends, hairy on both sides. Flowers blue or white, campanulate to subrotate, 0.5–0.6 cm long and wide, borne 1–3 together on axillary peduncles 0.6–4 cm long. Fruit a globose 4-valved, usually 4-seeded, capsule 0.3–0.4 cm long, glabrous; seeds usually 4, pale brown to black, ovoid, 1.5–1.7 mm long. Flowers and fruits from July to December.

Distribution and habitat

Native to the American tropics, now pantropical in distribution. It is found in open and grassy habitats and thorn scrub in most of the drier parts of India to an elevation of about 1800 m in the Himalayas.

Medicinal properties and uses

The whole plant is considered alterative, anthelmintic, antiphlogistic, bitter, emmenagogue, febrifuge, tonic and vermifuge; it is a well-known remedy for bowel complaints, specifically dysentery. In Ayurveda

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the whole plant is used as a brain tonic and to treat nervous debility and dysentery. Mixed with cumin and milk it is used to relieve fever and to treat memory loss, nervous debility, scrofula and syphilis. Among the tribal inhabitants of Maharashtra the dried plant powder is taken internally as a brain tonic. Mixed with *Ocimum sanctum* (*Lamiaceae*), it is prescribed for fever associated with diarrhoea or indigestion. The plant, mixed with oil, is used to promote hair growth. In the Khedbrahma region of northern Gujarat, the juice of the plant is used as a local application to promote healing of ulcers; it is taken internally by the Mahalis of Bihar to treat hysteria. The leaves are sometimes smoked to relieve asthma and chronic bronchitis. In Madhya Pradesh the leaf paste is applied to the fingers to treat whitlow. The roots are used in Ayurvedic practice to treat gastric and duodenal ulcers, and intermittent fever in children; its flowers are reportedly useful for treating uterine bleeding.

References

Asolkar *et al.* (1992), Bhatt *et al.* (1999), Chatterjee and Pakrashi (1995), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Jain *et al.* (1989), Kirtikar *et al.* (1935), Sivarajan and Balachandran (1994), Upadhye *et al.* (1994), Yoganarasimhan (1996).

Ipomoea cairica (L.) Sweet

Botanical synonyms

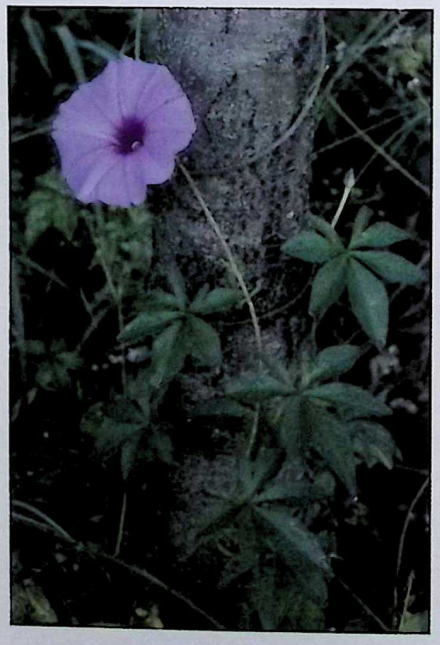
Convolvulus cairicus L., *Ipomoea palmata* Forssk., *I. pulchella* Roth

Common names

English: railway creeper; ***Kannada***: bekkina hejje.

Description

An extensive perennial climber with a tubercled stem and tuberous rootstock. Leaves ovate to orbicular in outline, 3–10 cm long and wide, deeply palmately 5–7-lobed, the lobes lanceolate to ovate or elliptic, acute or obtuse and mucronate at the apex, 3–5 cm long. Flowers borne on pedicels 1.2–3 cm long; sepals ovate, 4–6.5 mm long, obtuse to acute, mucronate; corolla, purple, blue-purple or white with a purple centre, funnel-shaped, 4.6–6 cm long, borne 1 or 3 together in axillary cymes. Fruits capsular, subglobose, 1–1.2 cm long, glabrous; seeds usually 4, subglobose to ovoid, blackish to tan, 0.4–0.6 cm long, densely short-tomentose, sometimes with long silky trichomes along the edges. Flowers and fruits thoughout the year.



Distribution and habitat

Probably of New World tropical origin, it is found in tropical Africa, from the eastern Mediterannean region through Asia to Taiwan and Malaysia. In India it is most commonly grown in gardens, on trellises and railway platforms as screens, and is naturalized in many parts of the country, particularly in western peninsular India,

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on open, disturbed sites, in thickets and hedges, along streams, and in fallow agricultural fields.

Medicinal properties and uses

The seeds are considered purgative and are used as a substitute for those of *Ipomoea nil*, which are sold commercially for this purpose. The crushed leaves are reportedly applied externally to relieve body rashes.

References

Asolkar *et al.* (1992), Chopra *et al.* (1969), CSIR (1948–1992), Yoganarasimhan (1996).

Ipomoea coccinea L.

Botanical synonym

Quamoclit coccinea Moench

Common names

None reported.

Description

A slender vine or scandent shrub up to several metres long. Leaves ovate, broadly cordate, 6–12 cm long, apex acute or acuminate, margins subentire, angled or broadly 3–5-lobed. Flowers erect, red, borne in long-peduncled, few-flowered axillary cymes up to 15 cm long; sepals 5, green, *c.* 6 mm long, obtuse, spurred from the apex; corolla tube slender, slightly enlarged upward, 2.5 cm long, the limb spreading, *c.* 2 cm in diameter. Fruits (capsules) subglobose or ovoid, *c.* 0.6 cm in diameter. In central India, flowering occurs between November and January and fruiting in January and February.

Distribution and habitat

Native to tropical America and cultivated in many parts of India as an ornamental plant; occasionally naturalized.

Medicinal properties and uses

The root induces sneezing.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956), Kirtikar *et al.* (1935).

Ipomoea pes-tigridis L.

Common names

Bengali: langulilata; ***English***: bindweed, Cupid's flower, tiger's foot; ***Malayalam***: pulichuvatu; ***Oriya***: bilaipado; ***Sanskrit***: vyaghranakhi; ***Tamil***: pulichovadi, punaikkirai; ***Telegu***: chikunuvvu, mekamadugu, puritikada.

Description

A spreading or climbing annual vine clothed with long, spreading yellow hairs. Leaves up to 11 cm long and 13 cm wide, sometimes entire but usually deeply palmately 5–9-lobed, lobes narrowly oval to obovate, narrowed above and below, 1.6–7

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cm long and 1–2.8 cm wide, thinly pubescent to strigose on both surfaces; outer bracts ovate or elliptic-oblong, inner bracts narrow-acute. Inflorescences few-flowered bracteate heads on pubescent peduncles up to 14 cm long, the bracts foliaceous, oblong to oblong-lanceolate, pubescent outside, the outer to 5 cm long and 0.6 cm wide, the inner narrower and shorter. Flowers subsessile; sepals lanceolate, 0.8–1.2 cm long, pubescent; corolla white, pink or purple, if coloured then with a darker throat, funnel-shaped, 3.5–5 cm long. Fruits capsular, ovoid, papery, brown, glabrous, 0.8–0.9 cm long and about 0.5 cm in diameter; seeds usually 4, black, 0.4 cm long, usually grey-pubescent. Flowers from July to November and fruits from November to December.

Distribution and habitat

Widely distributed throughout tropical Africa and Asia. In India, it is found throughout most of the country to an elevation of about 1200 m in dry, open habitats such as agricultural fields, grasslands, in coastal areas, commonly as a climber on bushes and hedges.

Medicinal properties and uses

The herb is used to treat boils and carbuncles and as an antidote to dog bites. The leaves are applied as a poultice to relieve boils, pimples and sores in the Philippines. The root is used as a purgative.

References

Chatterjee and Pakrashi (1995), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

Ipomoea quamoclit L.

Botanical synonyms

Quamoclit pinnata (Desr.) Bojer, *Q. vulgaris* Choisy

Common names

Bengali: kamalata, tarulata; ***English***: Indian pink, red jasmine; ***Hindi***: kamalata, kamlata; ***Kannada***: handara hoovu, kamalate, kempumallige; ***Malayalam***: suriyakanthi; ***Marathi***: sitachekesa, vishnukrant, vishnukrantu; ***Oriya***: kunjolota; ***Sanskrit***: kamalata, tarulata; ***Tamil***: kembumalligai, mayirmanikkam; ***Telegu***: kasiratnamu.

Description

A graceful, slender, glabrous, annual vine. Leaves 1–9 cm long, ovate to elliptic in outline, deeply pinnatisect with 9–19 alternate or opposite pairs of linear lobes, glabrous. Inflorescences with solitary flowers or 2–6-flowered cymes. Flowers with pedicels 0.9–2 cm long; sepals elliptic to oblong, 4–7 mm long, obtuse; corolla brilliant crimson, scarlet or rarely white, 2–3 cm long. Fruits capsular, ovoid, 6–8 mm long; seeds conical, dark brown to black, with dark patches or short, irregularly scattered trichomes. Flowers and fruits between July and November in peninsular India.

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Distribution and habitat

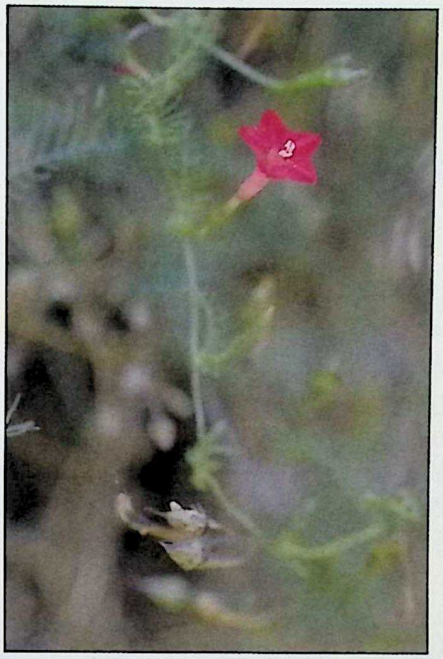
Native to tropical America and now widely cultivated in gardens and naturalized in the Old World tropics, including India.

Medicinal properties and uses

The plant is considered cooling and demulcent. To relieve haemorrhoids, the pounded leaves are applied as a poultice while the juice, mixed with *ghee* (butter-fat), is taken internally. The leaves are used as a plaster to treat carbuncles. The powdered root is used to induce sneezing.

References

Asolkar *et al.* (1992), Chatterjee and Pakrashi (1995), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).



Ipomoea turbinata Lag.

Botanical synonyms

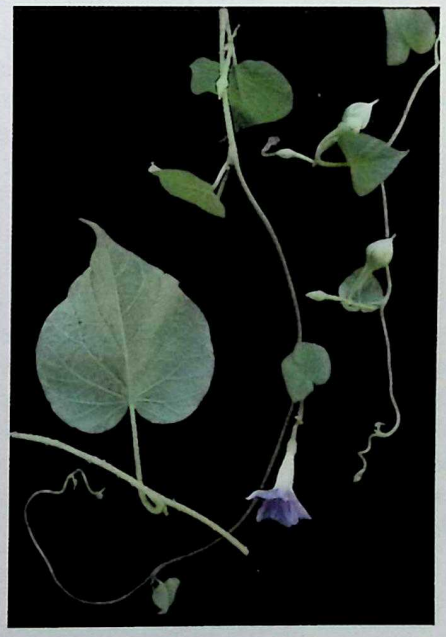
Calonyction muricatum (L.) G. Don, *Convolvulus muricatus* L., *Ipomoea muricata* (L.) Jacq.

Common names

Bengali: michai; ***Gujarati***: garayo; ***Hindi***: michai; ***Konkani***: barikbhauri, ravanpudya; ***Malayalam***: mukkattikay; ***Tamil***: kattutali.

Description

A large annual, glabrous vine, usually with muricate stems. Leaves 6–13 cm wide and 7–18 cm long, ovate to orbicular, glabrous, base cordate, apex acute to acuminate, margins entire; petioles 7.5–15 cm long. Inflorescences 1- to few-flowered, peduncles 3–6 cm long, muricate; flowers on pedicels 1–2 cm long; sepals unequal, ovate to oblong, corolla nocturnal, funnel-shaped, lavender to purplish, 5–7.5 cm long, tube narrow and cylindrical 3–6 cm long, hairy within. Fruits capsular, ovoid, apiculate, 1.8–2 cm long and 1.3–1.7 cm in diameter; seeds ovoid, smooth, shiny, black, 1 cm long. In central India flowering and fruiting occur between September and January.



Distribution and habitat

Pantropical in distribution, perhaps originally from Mexico, it is frequently culti-

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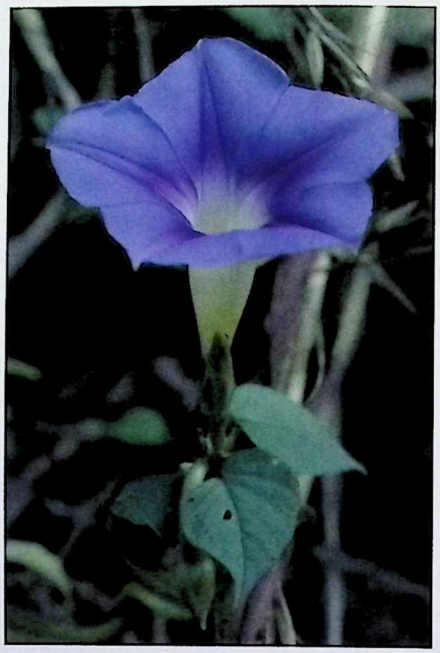
vated and naturalized in India from the upper Gangetic plain and the Himalayas up to 1500 m to West Bengal and southwards through the hills of central India to Karnataka, usually near villages.



Medicinal properties and uses

The bitter seeds are considered purgative and used mainly as a substitute for those of *Ipomoea nil* (known commercially as *Kaladana*). Among the Mundas of Chota Nagpur (in Bihar), the powdered seeds are reportedly taken in small doses to relieve fevers. The juice of the leaves is used as an insecticide.

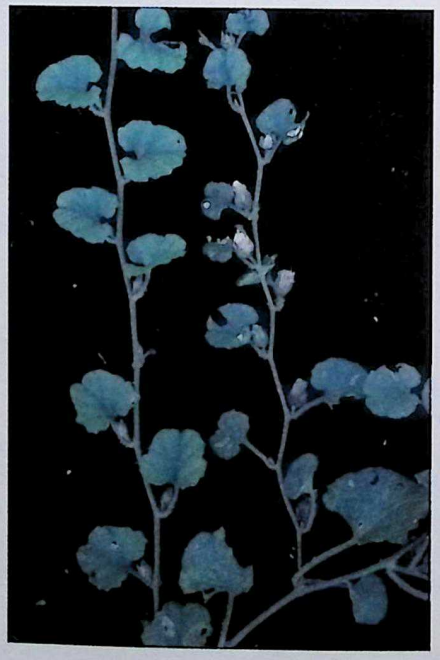
References

Asolkar *et al.* (1992), Chopra *et al.* (1956), Kirtikar *et al.* (1935).

Merremia gangetica (L.) Cufodont

Botanical synonyms

Convolvulus gangeticus L., *C. reniformis* Roxb., *Evolvulus emarginatus* Burm. f., *Ipomoea reniformis* (Roxb.) Choisy, *Merremia emarginata* (Burm. f.) Hall. f.



Common names

Bengali: bhuikamri, indurkani, undirakanipana; ***Gujarati***: undarakani; ***Hindi***: musakani; ***Kannada***: valli haruhi; ***Konkani***: underkani; ***Malayalam***: eliccevi; ***Marathi***: underkani; ***Sanskrit***: akhukarni, mushakarni; ***Tamil***: elikathu kerrai, perettaikirray; ***Telegu***: elikajemedu, perettaikkiray, toinnuatali; ***Urdu***: chukakani, sharadam, toinnuatali.

Description

A prostrate, much-branched, glabrous or sparsely pubescent perennial vine, often rooting at the nodes. Leaves reniform to broadly ovate, 0.5–3 cm long, base cordate with a broadly rounded sinus and rounded basal lobes, obtuse to broadly rounded or emarginate at apex, margins coarsely crenate or entire, glabrous or sparsely appressed pilose. Inflorescences axillary, solitary or in 2–3-flowered cymose groups. Flowers with very short or absent peduncles; sepals obovate to orbicular, the outer to 3 mm long, obtuse with a distinctly mucronate apex, the inner 3–4 mm long, deeply emarginate, all

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pubescent on the back and ciliate; corolla yellow (or pinkish) with a paler tube, campanulate, 5–9 mm long. Fruits capsular, subglobose, 5–6 mm long, longitudinally sulcate, glabrous, brownish-black or black; seeds greyish-brown, glabrous, dotted, 2.5 mm long. Flowers and fruits from August to December.

Distribution and habitat

Widely distributed in tropical Africa and Asia. In India it is found in damp, grassy habitats in the upper Gangetic plain, Bihar and West Bengal, southwards through peninsular India to Tamilnadu up to 900 m elevation.

Medicinal properties and uses

In Ayurveda, the plant is considered cooling, anthelmintic, laxative and carminative; its decoction reportedly acts as a deobstruent, diuretic and alterative, and is used to treat rheumatism, neuralgia and headache, diseases of the kidneys, bladder, heart and lungs, fevers, strangury, urethral discharges, anaemia and leucoderma, and for resolving tumours. The leaf juice is given for migraine and as an eardrop to relieve abscesses and ulcers. In Unani medicine, the plant is considered antipyretic and useful for treating headache, bronchitis, paralysis, inflammations, and fevers due to enlargement of the liver; the rose-flowered variety is used for treating diseases of the brain and nose, paralysis, wounds and inflammations, while the root of the yellow-flowered variety is used to treat diseases of the eye and of the gums. In Siddha, the whole plant is used to treat stomach disorders, diarrhoea, anaemia, worm infestations, fistula and leucorrhoea. A decoction of the whole plant is used to treat cough, headache, neuralgia and rheumatism. The powdered leaves are used as a snuff during epileptic seizures. The juice of the plant acts as a purgative and is given internally to relieve migraine headache; as an eardrop it is used to promote the healing of abscesses. The root and powdered leaves are mixed with flowers and applied externally to relieve swellings.

References

Chatterjee and Pakrashi (1995), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Sivarajan and Balachandran (1994), Yoganarasimhan (1996).

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Operculina turpethum (L.) Silva Manso

Botanical synonyms

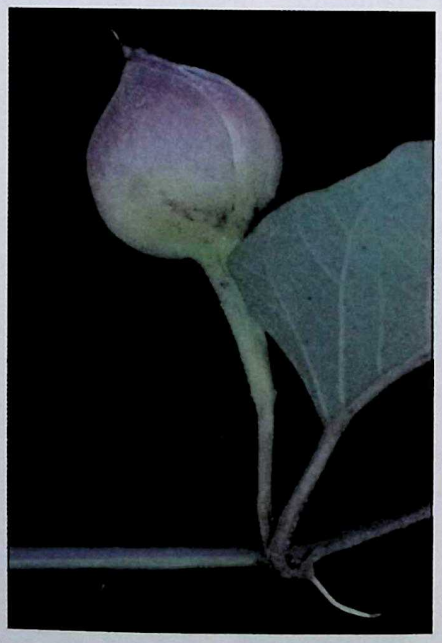
Convolvulus turpethum L., *Ipomoea anceps* (L.) Roem. & Schultes, *I. turpethum* (L.) R. Br.

Common names

Bengali: dudhkalmi, dudiyakalmi, teori, tohri; ***English***: Indian jalap, turpeth; ***Gujarati***: nahotara, nashotar; ***Hindi***: nisotar, nisoth, pitohri; ***Kannada***: bangada-balli, bilenagadanti, bilitigade, devadanti, nagadanti, tigade; ***Malayalam***: chivaka, rochani, tribhandi, trikolpakonna; ***Marathi***: nishottar, nisottara, phutkari; ***Oriya***: dudholomo; ***Punjabi***: chitabansa, nisot, turbud; ***Sanskrit***: triputa, trivrit, trivrt; ***Tamil***: kumbam, paganrai, samaram, shivadai; ***Telegu***: ettategada, nallategada, tegada, tellategada; ***Urdu***: turbud.

Description

An extensive perennial vine with milky juice and fleshy, branched roots; stems usually angled or narrowly 3–5-winged. Leaves variable in shape, orbicular, broadly ovate, ovate-lanceolate or lanceolate, 5–15 cm long, base cordate to hastate, apex acuminate, acute or obtuse to rounded, margins entire or more commonly coarsely dentate to shallowly lobed, upper surfaces glabrous or appressed-pilose, lower surfaces pubescent. Inflorescences axillary, cymosely 1- or few-flowered. Flowers with peduncles 0.2–1.8 cm long, glabrous or pubescent; sepals ovate, 1.5–2.5 cm long, acute or shortly acuminate, the outer pubescent, the inner glabrous; corolla white or white with a yellowish base, campanulate to broadly funnel-shaped, 3–4.5 cm long, glabrous or with yellowish glandular hairs outside. Fruits capsular, depressed-globose, 1.5 cm long, enclosed in the enlarged, papery sepals; seeds dull black, glabrous, 6 mm long. In central India, flowering occurs mainly between August and October, and fruiting from November to December.



Distribution and habitat

Distributed from tropical Africa and Madagascar to southern Asia to Australia and Polynesia; introduced to the Caribbean islands. Found throughout India in open, disturbed habitats and in woody thickets

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and hedges to an altitude of about 900 m. Occasionally grown in gardens as an ornamental plant.

Medicinal properties and uses

This plant is the source of the drug known as *Trivrit*, *Turpeth* or *Indian Jalap*, used in India as a purgative or laxative. The drug consists of the root bark (sometimes mixed with stem pieces), which is sold in two forms, white turpeth and black turpeth. The white form is preferred to the black as a cathartic, the latter producing drastic purging and causing vomiting, fainting and giddiness. It is administered in the form of a powder or in combination with equal quantities of cream of tartar. The root bark is also used alone or in combination with other drugs in Ayurvedic, Unani and Siddha practice to treat a variety of ailments and conditions; it is an ingredient of several Ayurvedic preparations used to treat dropsy, dyspepsia with constipation and flatulence, gout and rheumatism, and other inflammations. The leaves are reportedly useful for treating piles.

References

Chatterjee and Pakrashi (1995), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Sivarajan and Balachandran (1994), Yoganarasimhan (1996).

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Costaceae

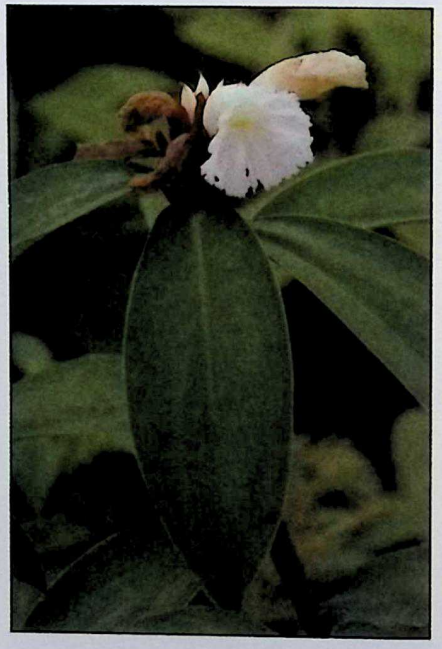
Costus speciosus (Koenig) Sm.

Botanical synonyms

Banksia speciosa Koenig, *Costus speciosus* var. *nepalensis* (Rosc.) Baker

Common names

Bengali: keu, kust; ***Gujarati***: pokaramula; ***Hindi***: keokanda, keu, kust; ***Kannada***: changalakoshta, changal kostha, chengalvakoshtu; ***Malayalam***: anakkuva, channakuva, kottam, pushkaramulam; ***Marathi***: kemuka, penva, pinnga, pushkarmula; ***Oriya***: chittorokudho, ghauapohora, kudho; ***Sanskrit***: canda, kushta; ***Tamil***: kottam, kuravamkuttaiyidukki, kugaimanjal, malaivasambu, ubariyavi, vengottam; ***Telegu***: bommakachika, chengalvakoshtu, kushthamu, pushkaramulam.



Description

An erect succulent herb up to 2.7 m tall, with a tuberous rootstock. Leaves spirally arranged on stem, 15–30 cm long and 5.7–7.5 cm wide, oblong to oblanceolate, glabrous above, silky pubescent beneath, apex caudate-acuminate, base rounded. Flowers large, white with a yellow centre, borne in dense terminal spikes; bracts 2–3.2 cm long, ovate, bright red to reddish-brown. Fruit (capsule) ovoid, 2 cm in diameter, 3-valved, red when ripe; seeds black, with a white aril.

Distribution and habitat

Native to tropical Asia from India and Sri Lanka to New Guinea and Malesia. It is found in moist tropical and subtropical regions of India up to about 1000 m elevation, and is particularly common in West Bengal, Konkan (coastal districts of Maharashtra) and South India; often cultivated as an ornamental plant.

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Medicinal properties and uses

The rhizome (root) is considered bitter, astringent, purgative, depurative, stimulant, tonic and anthelmintic. In Ayurveda it is used to treat bronchitis, fever, dyspepsia, inflammations, anaemia, diabetes, leprosy and other skin diseases, rheumatism and lumbago; it is an ingredient of many compound Ayurvedic drugs. In northern India it is used as a substitute for the roots of *Gloriosa superba* (*Colchicaceae*). In Siddha, it is reportedly used to treat fevers, eye, skin and urinary diseases, and mental disorders. It is an ingredient of the drug *Amber mezhugu*, used to treat rheumatism. The juice of the stem bark is reportedly taken to relieve burning sensations in urination. Among the Kadars of the Anamalai Hills of Tamilnadu, the filtrate of the rhizome paste is used as an eardrop to promote the healing of ear infections. A chutney made from the burnt tuber, sugar and tamarind is eaten for the treatment of dysentery and other digestive problems.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956), Kirtikar *et al.* (1935), Rajendra and Henry (1994), Shah and Singh (1990), Sivarajan and Balachandran (1994), Yoganarasimhan (1996).

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Cucurbitaceae

Cucumis melo L.

Botanical synonyms

Cucumis callosus (Rottl.) Cogn., *C. trigonus* Roxb.

Common names

Bengali: kakri, kharmuj; ***English***: muskmelon, sweetmelon; ***Gujarati***: chibdu; ***Hindi***: kharboj, kharbuja; ***Kannada***: budame kayi; ***Konkani***: chibdud, gibud, molao; ***Marathi***: chibunda, kharbuja; ***Sanskrit***: ervaru, ervaruh, karkati; ***Tamil***: karbujadosa, kattuttumatti, mulampazham, peddadosrai, peddakai; ***Telegu***: kharbujadosa; ***Urdu***: kharbuzah.

Description

A slender perennial, climbing or creeping herb with a thick rootstock. Leaves suborbicular, 5-angled or -lobed, scabrous on both surfaces, cordate at base, to 9 cm long and 8 cm wide; petioles 5 cm long. Flowers small, yellow, solitary; male flowers borne in small clusters, female solitary. Fruit (berry) rounded or ellipsoid, obscurely trigonous, smooth, to 5 cm long and 4 cm in diameter, yellow with age, with green stripes when young; seeds obovoid, rounded at apex. In central India flowers between July and August, and fruits in August and September.

Distribution and habitat

Extensively cultivated for its fruits, eaten as a vegetable in many tropical countries, including throughout India, where it is sometimes naturalized in open scrub forests.

Medicinal properties and uses

The seeds are considered diuretic and cooling. The pulp of the fruit is diuretic and

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demulcent and used for removing tan freckles and for treating chronic eczema. In Unani medicine the fruit is reportedly used to treat ophthalmia and urinary discharges.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

Diplocyclos palmatus (L.) C. Jeffrey

Botanical synonyms

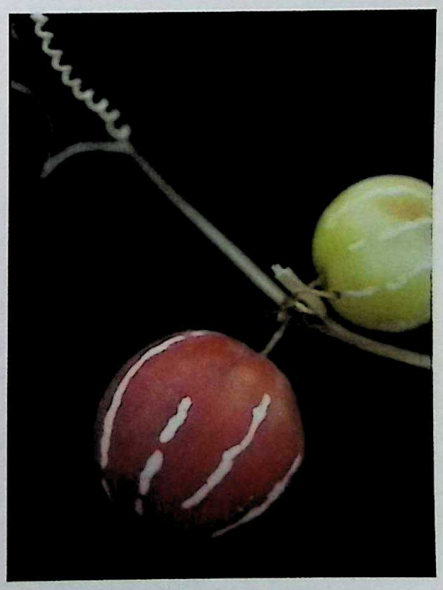
Bryonia laciniosa sensu L., *B. palmatus* L., *Bryonopsis laciniosa* sensu Naud., *Zehneria erythrocarpa* F. Muell.

Common names

Bengali: mala, shivalingani; ***Gujarati***: chivalingi, shivalingi, shivlingi; ***Hindi***: gargumaru, ishwaralingi, shivalingi; ***Kannada***: linga tonde balli, malingana balli; ***Malayalam***: neohmaka; ***Marathi***: kavadori, kavalechedole, vaduballi; ***Sanskrit***: lingi, lingini; ***Telegu***: lingadonda.

Description

A tuberous, slender annual vine with glabrous stems and forked tendrils. Leaves ovate-suborbicular in outline, 7.5–15 cm long and up to 12 cm wide, deeply 3–5-lobed, base cordate, blade membranous, scabrid above with minute red scales, smooth or slightly scabrid beneath; lobes lanceolate, acute to acuminate, margins coarsely, irregularly serrate or sinuate and distantly denticulate; petioles 2–5 cm long. Flowers small, greenish-yellow, the female flowers borne in fascicles, the male solitary; corolla 3–4 mm, lobes ovate-oblong, acute, pubescent. Fruit (berry) rounded, 2–3 cm in diameter, bluish-green with eight vertical white streaks, ripening red; seeds few, brown, obovate, compressed, 4 mm long and 3 mm wide, encircled by a prominent raised band. Flowers between August and September and fruits in September and October in central India.



Distribution and habitat

Found throughout the Old World tropics from tropical Africa eastwards to Australia; in India it is common throughout, and typically found in village hedges.

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Medicinal properties and uses

The plant is considered bitter, aperient and tonic, and used to relieve bilious attack. The leaves are applied topically to relieve inflammations. The seeds are sometimes taken in combination with other plant drugs by women to help conception and prevent miscarriage. In Ayurveda, the fruit is used as an aphrodisiac and tonic. In Siddha, the whole plant is used to relieve constipation.

References

Asolkar *et al.* (1992), Bhatt and Mitaliya (1999), Bhatt *et al.* (1999), Chopra *et al.* (1956), Jain *et al.* (1989), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

Lagenaria siceraria (Molina) Standley

Botanical synonyms

Cucurbita siceraria Molina, *Lagenaria leucantha* (Duchesne) Rusby, *L. vulgaris* Seringe

Common names

Bengali: kodulau, lau, tiktalau; ***English***: bottle gourd, calabash gourd; ***Gujarati***: dudhi, dudio, kadvitumbadi, tumada; ***Hindi***: kaddu, kadutumbi, kashiphal, tumri; ***Kannada***: halagumbala, soreballi, sorekayi; ***Konkani***: dudi, dudio, mardudi; ***Malayalam***: bellashora, garadudi, kaippancura; ***Marathi***: bhopala, dudhya, kadubhopla; ***Punjabi***: ghiya, golkaddu, kabulikaddu, keddi, lauki, tumba; ***Sanskrit***: iksvakuh, katutumbi; ***Tamil***: shorakkai; ***Telegu***: anapakai, anugadaya, gubbakaya, kundanuga, nelanuga, sorrakaya; ***Urdu***: kadugol, tumbari.

Description

A large, pubescent, climbing or trailing herb with stout, 5-angled stems and bifid tendrils. Leaves to 15 cm diameter, ovate or orbicular, base cordate, margins dentate, usually 5-lobed; petiole long, with 2 glands at its apex. Flowers large, white, solitary, monoecious or dioecious, the male long- and the female short-peduncled; calyx tube funnel-shaped, subcampanulate, teeth 5, narrow, petals 5, free, obovate, 2.5–5 cm long, crumpled, hairy on both sides. Fruits of variable size and shape, but usually bottle-shaped, up to 1.8 m long, with a hard, durable, smooth shell. Seeds numerous, white, smooth, 1.6–2 cm long, horizontally compressed with marginal groove.

Distribution and habitat

The cultivated form of the species is considered to be indigenous to India, the Moluccas (Indonesia) and northeastern Africa (Ethiopia); it is believed to have been introduced to the American tropics before the arrival of the Europeans. Found throughout India in its wild state, and cultivated for its fruits, which are eaten as a vegetable.

Medicinal properties and uses

In traditional Indian medicine two varieties (sweet- and bitter-fruited) are distinguished. The stem and fruit of the sweet-fruit variety are used in Ayurveda to cure biliousness,

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and the fruit is used to treat leucorrhoea. The leaves of the bitter-fruit variety are used to treat jaundice, leucorrhoea, vaginal and uterine complaints and earache, and its fruit is used in the treatment of asthma, bronchitis, inflammations, oedema, ulcers and pains; ashes of the fruit, mixed with honey, are applied to the eyes to treat night blindness. In Unani medicine, the fruit of the sweet-fruit variety is considered tonic to the liver, vulnerary, antiperiodic and useful for relieving muscular pain and dry cough; the ash of the fruit rind is styptic and vulnerary. The flowers of the bitter-fruit variety are considered cooling in Unani practice, and useful for treating ophthalmia and toothache, and its fruits for treating bronchitis. A syrup prepared from the tender fruit is used as a pectoral. The juice of the fruit mixed with lime juice is used as an application for pimples; boiled in oil it is used to treat rheumatism. The fruit pulp is applied to the soles of the feet to relieve burning. The seeds are used as an anthelmintic; both the seeds and roots are used to treat dropsy. The seed oil is applied externally to relieve headache. A decoction of the leaves mixed with sugar is given to treat jaundice.

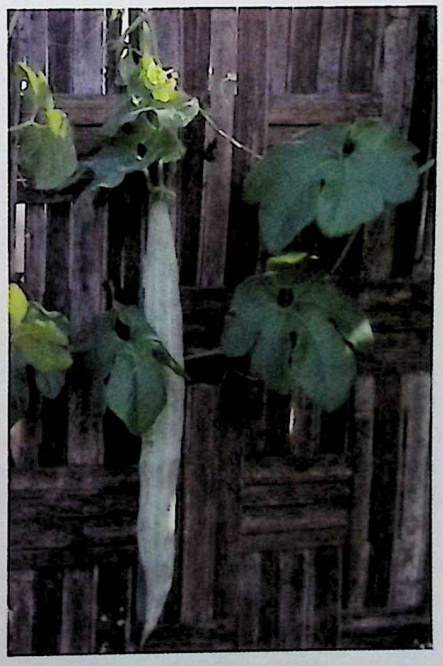
References

Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935), Sivarajan and Balachandran (1994), Yoganarasimhan (1996).

Luffa acutangula (L.) Roxb.

Botanical synonyms

Cucumis acutangulus L., *Cucurbita umbellata* Klein ex Willd., *Luffa acutangula* var. *amara* (Roxb.) Clarke, *Luffa forskalii* Schweinf. ex Harms, *L. hermaphrodita* Singh ex Bandhari, *L. kleinii* Wight & Arn., *L. umbellata* (Klein ex Willd.) Roem.



Common names

Bengali: jhinga, sataputi; ***English***: ridged or ribbed gourd; ***Gujarati***: ghisoda; ***Hindi***: jhimani, jhinga tori, kali tori; ***Kannada***: heere balli, kirekayi; ***Konkani***: gonsali, sirgonsolim, sirgousali; ***Malayalam***: djinji, piccinna, pichenga, puichenggah; ***Marathi***: dodali, sataputi, shirola; ***Oriya***: janhi; ***Sanskrit***: jalini, jhingaka, kosataki, koshataki; ***Tamil***: pekankai, pikunkai, pirkankai; ***Telegu***: birakaya, burkai; ***Urdu***: torai.

Description

A large, annual climber with slender, shortly pubescent, 5-angled stems; tendrils usually 3-branched. Leaves alternate, orbicular in outline, 15–20 cm long and wide, 5–7-angled or lobed, scabrid on both sides, base cordate, lateral lobes usually obtuse, central lobe acute to subacuminate; petioles 5–12 cm long, angular, scabrid. Plants monoecious; male flowers yellow with 3 stamens, borne in 10–20-flowered racemes 10–15 cm long; female flowers yellow, solitary, in same axils as males, on 5–10-cm-long peduncles. Fruit cylindrical or club-shaped, tapering towards the base, usually 15–30 cm long and 5 cm in diameter,

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smooth, with 10 prominent, narrowly angled, longitudinal ridges. Seeds compressed, 0.9–1.4 cm long and 0.5–0.8 cm wide, slightly corrugated on edges, not winged, black or white when ripe. In central Indian deciduous forest regions, flowering occurs mainly in July and August and fruits mature in September and October.

Distribution and habitat

Pantropical in distribution, commonly cultivated throughout India in gardens for its fruits, which are eaten as a vegetable. Considered to be indigenous to the Indian subcontinent and Malaysia, it is found wild in northwest India, Bihar, West Bengal, Sikkim and Assam, and in Tamilnadu.

Medicinal properties and uses

In Ayurveda the fruit and leaves are considered stomachic, antibilious and antipyretic; they are both used to treat bronchitis, and the leaves to treat asthma. The pounded leaves are used as a poultice to treat haemorrhoids, leprosy and splenitis. The juice of the fresh leaves is reportedly useful for treating granular conjunctivitis in children. A fine paste of the tendrils is used externally and internally to treat snake bite among the Santhalis in southern Bihar. The ripe seeds are bitter and reportedly possess emetic and purgative properties. Although the seed oil is toxic, it is used as a local application to treat skin affections among the inhabitants of Bhadrak District in northeastern Orissa.

References

Chopra *et al.* (1956, 1969), CSIR (1948–1992), Girach *et al.* (1997), Kirtikar *et al.* (1935), Sivarajan and Balachandran (1994), Varma (1997), Yoganarasimhan (1996).

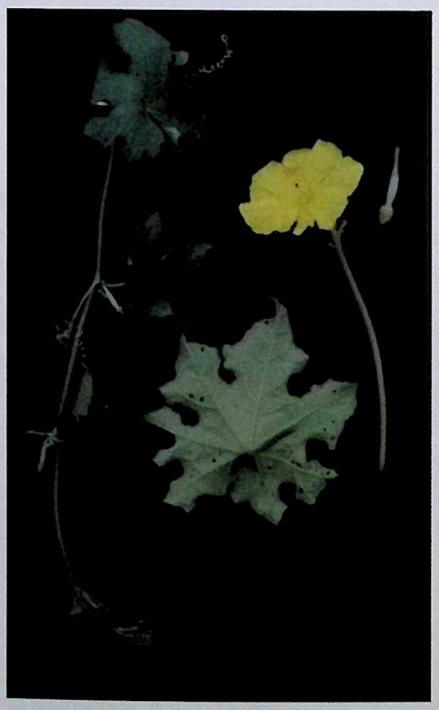
Luffa cylindrica (L.) M. Roemer

Botanical synonyms

Luffa aegyptiaca Mill., *L. pentandra* Roxb., *Momordica cylindrica* L.

Common names

Bengali: dhundal, hastighasha; ***English***: smooth loofah, sponge gourd, vegetable sponge; ***Gujarati***: galaka, martigonsali, turia; ***Hindi***: ghiatorui, nenua, purula; ***Kannada***: tuppahirekai; ***Konkani***: porgonsali, porgousali; ***Malayalam***: kattupeechal, kattupiccinna; ***Marathi***: ghadaghosali, ghosali, paroshi; ***Punjabi***: ghiatori, ghigandoli, ghiturai; ***Sanskrit***: dhamargava, dhamargavah, koshataki; ***Tamil***: mozhuku pirkankai, pichukku, pikku; ***Telegu***: guthibira, guttibira, netibira, nunebira; ***Urdu***: turi.



Description

A large climber with a stout, 5-angled, pubescent stem; tendrils usually 2–3-branched. Leaves large, 10–20 cm long and 9–21 cm wide, orbicular to reniform-orbicular in outline, base cordate, 5–7-lobed, lobes broadly triangular, acute, margins irregularly, shallowly dentate, hispid-scabrid above, finely pubescent-hispid beneath; petioles

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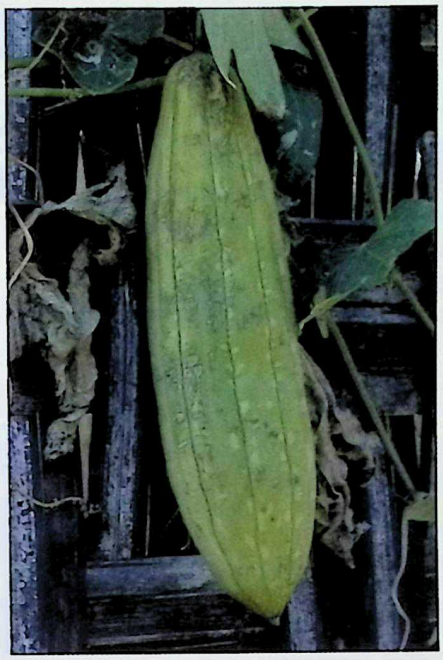
2–8 cm long. Male and female flowers deep, bright yellow; male flowers borne in racemes on peduncles 6–17 cm long, usually aggregated near apex, stamens usually 5; female flowers solitary on peduncle 7–15 cm long. Fruit smooth, cylindrical, usually 15–30 cm long (occasionally up to 2.5 m) and 6–10 cm in diameter, smooth with 10 dark green longitudinal lines, fibrous within; seeds 1.2 cm long and 0.8 cm wide including the narrow, smooth, marginal wing, broadly ellipsoid, longitudinally compressed, rough on surface, blackish.



Distribution and habitat

Pantropical in distribution, its centre of origin uncertain but sometimes considered to be indigenous to India. Commonly cultivated in gardens throughout the tropics for its fruits, which are eaten as a vegetable.

Medicinal properties and uses

The tender fruit is considered diuretic and lactagogue. In Ayurveda it is used to treat biliousness and leprosy. In Unani, the fruit is considered an excellent tonic and expectorant; it is used to treat biliousness, spleen diseases, leprosy, piles, fever, haematuria, syphilis and bronchitis. The juice of the fruit is purgative. The mature seeds are bitter, emetic and cathartic. The seed oil, used as a substitute for olive oil, is said to be useful for skin affections. In China, the ripe fruit is used, after burning and pulverizing, as a carminative and anthelmintic. The ripe fruits are sometimes left on the vine to dry, yielding a sponge widely used for bathing, scrubbing dishes and kitchen utensils, washing cars, and for a variety of other purposes; these are known commercially as *loofah sponges*.

References

Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935), Sivarajan and Balachandran (1994), Yoganarasimhan (1996).

Momordica charantia L.

Common names

Bengali: baramasiya, jethuya, karala, karela, potikakar; ***English***: bitter gourd, carilla fruit; ***Gujarati***: karela, karelo, karelu, korela; ***Hindi***: karela, kareli, karola; ***Kannada***: hagal, hagola, kagalakayi; ***Konkani***: karatim; ***Malayalam***: kaippa, kaippavalli, kappakka, pantipavel, pavakkacheti, paval; ***Marathi***: karala, karle; ***Oriya***: karena; ***Punjabi***: karela, karila; ***Sanskrit***: karavella, karavellah, karavellaka, karavellam, sushavi; ***Tamil***: pakal, pavakka, pavakkachedi, pavakkayi; ***Telegu***: kakara, mettakakara, tellakakara, urakakara; ***Urdu***: karella.

Description

A monoecious annual or perennial climber with a slender, 4–5-angled, much-branched stem, more or less pubescent; tendrils simple. Leaves alternate, suborbicular, 3–10 cm long and 5–10 cm wide, deeply palmately 5–7-lobed, base deeply cordate, glabrous or slightly pubescent, lobes irregularly toothed; petioles 3.5–7.5 cm long. Flowers pale to orange-yellow, solitary in leaf axils, pedicels 5–10 cm long with a suborbicular bract about the middle of the male and at the base of the female pedicels, corolla of both male

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and female flowers up to 3.5 cm in diameter. Fruits 5–25 cm long and 5 cm wide, pendulous, tapering towards apex, irregularly longitudinally ridged with numerous triangular tubercles between ridges, ripening bright orange, splitting into three irregular valves disclosing many brown or white compressed seeds 0.8–1.6 cm long, embedded in red pulp. Several types are grown in India, differing in their growth habit and in the size and shape of their fruits. In central India, flowering occurs mainly in July and August, and fruiting in August and September.

Distribution and habitat

Occurs naturally in India, Sri Lanka, Malaysia, China and tropical Africa; probably introduced into the American tropics. In India, it is usually found under cultivation as a vegetable crop and occasionally naturalized, up to an altitude of 1500 m.

Medicinal properties and uses

The whole plant is used in traditional Indian medicine and is the source of *Karavellam*, a reputed drug used to treat diabetes mellitus. In Ayurveda the fruit is considered laxative, antidiabetic, cardiotonic, anthelmintic and a digestive stimulant; it is used to treat coughs, respiratory diseases, including asthma and bronchitis, fever, intestinal worms, ulcers, skin diseases, biliousness, anaemia, jaundice, rheumatism, gout, liver and spleen complaints, urinary discharges, flatulence and piles. In Unani medicine, it is used to treat syphilis, rheumatism, splenic disorders and ophthalmia. The powdered fruit is thought to be useful for healing wounds as well as intractable and malignant ulcers. Both the fruit and leaves are used as a vermifuge and for treating piles, leprosy and jaundice. The juice of the leaves is emetic and purgative; it is given to treat bilious affections, and rubbed on the soles of the feet to relieve burning, and as an ointment for sores. The astringent roots are used to treat haemorrhoids; in Ayurveda the root is used to treat ophthalmia and prolapse of the vagina. In Brazil, the seeds are used as an anthelmintic.

References

Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935), Sivarajan and Balachandran (1994), Yoganarasimhan (1996).

Mukia maderaspatana (L.) Roem.

Botanical synonyms

Bryonia cordifolia L. f.., *B. scabrella* L. f., *Coccinea cordifolia* (L.) Cogn., *Cucumis maderaspatanus* L., *Melothria maderaspatana* (L.) Cogn., *Mukia scabrella* (L. f.) Arn.

Common names

Bengali: bilari; ***Hindi***: agumaki, bilari; ***Kannada***: mani tonde; ***Malayalam***: mukkalpiram; ***Marathi***: ghugri; ***Punjabi***: gwala kakri; ***Sanskrit***: trikosaki; ***Tamil***: musimusikkayi, musumusukkai; ***Telegu***: kutarubudama, nugudosa, pottibudamu, putribudinga.

Description

A prostrate or climbing, much-branched, annual herb, strongly hispid-scabrid with

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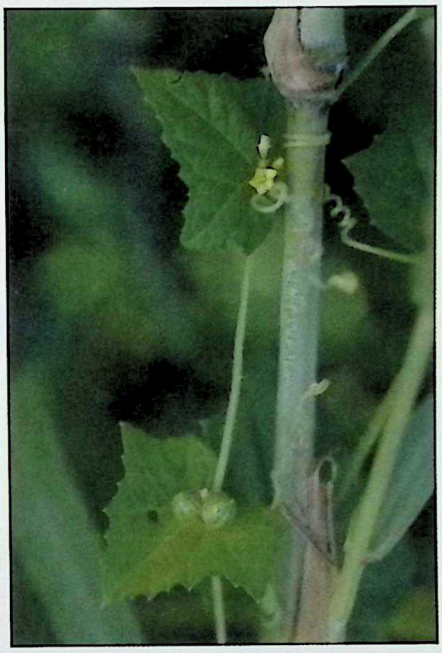
spreading bristly hairs and simple tendrils. Leaves alternate, broadly triangular in outline, 5-angled or 3–5-lobed, 3–11 cm long and wide, apex acute, base deeply cordate, margins shortly, irregularly dentate, dark green and scabrid above, paler green and hispid beneath; petioles 0.6–2.5 cm long, hairy. Flowers small, pale yellow; male flowers fascicled on very short peduncles, female flowers usually solitary, sessile; calyx hairy, tube 2 mm long, narrowly campanulate; corolla pubescent, segments ovate-oblong, rounded at the apex, 2 mm long. Fruits (berry) globose-ellipsoid, to 1.5 cm in diameter, pale green with longitudinal cream stripes, ripening scarlet; seeds numerous, to 4 mm long and 2 mm broad, closely arranged, compressed, ellipsoid, grey. Flowers mainly from July to September and fruits from October to November in peninsular India.



Distribution and habitat

Throughout the Old World tropics and subtropics. In India it is found in most regions to an elevation of 1800 m. Frequent in village hedges, other open habitats, and disturbed sites in semi-evergreen and deciduous forests.

Medicinal properties and uses

The tender shoots and bitter leaves are used as a gentle aperient, and are prescribed for vertigo and biliousness. The root of the plant, when chewed, relieves toothache; a decoction of the root is used to relieve flatulence. A decoction of the seeds is used as a sudorific; the crushed seeds are applied externally to relieve body-aches. Due to its expectorant properties, the plant is sometimes used in compound preparations for cough, but trials indicate that its action is slow and unsatisfactory. In Ayurveda, the fruits are reportedly used in the treatment of dysuria, piles, polyuria and tuberculosis. In Siddha the root and leaf are used to treat fever, dyspnoea, abdominal disorders, cough and vomiting.

References

Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Sivarajan and Balachandran (1994), Yoganarasimhan (1996).

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Cyperaceae

Cyperus iria L.

Common names

Bengali: burachucha; ***Kannada***: dabbe jambu hullu.

Description

A glabrous, usually annual herb with fibrous roots and a tufted, striate, 3-angled stem 35–50 cm long. Leaves as long as or shorter than the stem, multistriate, apex finely acuminate. Inflorescence (umbel) composed of many primary rays 2.5–12.5 cm long, bearing umbellules of narrow, few-flowered spikelets; bracts 3–5, up to 20 cm long; spikelets 0.6–0.8 cm long, linear-oblong, obtuse, 6–20-flowered, golden yellow; glumes 1.2–2.5 mm long, elliptic-ovate, apex obtuse. Achenes 1–2 mm long and 0.5–0.8 mm wide, obovate, 3-angled, maturing brown or black.

Distribution and habitat

Widely distributed in Asia from Iran and Afghanistan through the Indian subcontinent northeastwards to China and Japan, and eastwards to Malesia and Australia; also found in tropical East Africa and the Mediterranean region; apparently introduced and naturalized in southeastern USA, the Caribbean islands and South America. It is found in rice fields and other wet, open habitats throughout India, Sri Lanka, Southeast Asia, tropical Australia and the Mediterranean region.

Medicinal properties and uses

The plant is considered tonic, stimulant, stomachic and astringent.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

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Cyperus rotundus L.

Common names

Bengali: motha, mutha; ***English***: nut grass; ***Gujarati***: moth, motha; ***Hindi***: motha, mutha; ***Kannada***: bhadrahullu, konnarigedde, tungegadde; ***Marathi***: bimbal, motha, musta; ***Sanskrit***: musta, mustaka; ***Tamil***: kora, korai; ***Telegu***: bhadramuste, gandala, kaivartakamuste, shakhatungaveru, tungamuste.

Description

A glabrous perennial herb with slender stolons 10–20 cm long, bearing hard, fragrant, globose-ovoid tubers up to 1.2 cm long and 0.3–0.7 cm in diameter; culms solitary or few together, sparsely tufted, erect, 10–75 cm tall, 3-angled at top. Leaves narrowly linear, shorter or longer than stem, 0.4–0.8 cm wide, 1-nerved, dark green above, paler beneath. Inflorescence (umbel) simple or compound, rays 2–8, each up to 7.5 cm long, bearing short spikes of 3–10 spreading red-brown spikelets; bracts 3, variable in length up to 15 cm long; spikelets linear, variable in length, 1.6–3.8 cm by 2.5 mm, red-brown turning black, 10–50-flowered; glume 3–4 mm long, oblong, apex obtuse or apiculate, reddish-brown. Achenes oblong to ovate-oblong, 3-sided, 1.3–1.5 mm long and 0.5–0.7 mm wide, maturing brown.

Distribution and habitat

A cosmopolitan weed found in all tropical, subtropical and temperate regions of the world. In India it is common in open, disturbed habitats to an elevation of about 1800 m.

Medicinal properties and uses

The roots (tubers) are considered diuretic, carminative, emmenagogue, anthelmintic, galactagogue, diaphoretic, astringent, stomachic and stimulant. They are used to treat stomach disorders and irritation of the bowels, and have been shown to be effective in the treatment of conjunctivitis. A paste of the roots is used externally to promote healing of wounds and sores. In Ayurveda the roots are also used to treat leprosy, fever, blood diseases, biliousness, dysentery, pruritis, vomiting, epilepsy and ophthalmia; in Unani practice they are used to treat fevers, dyspepsia and urinary concretions. In the Konkan the fresh tubers are applied to the breast as a galactagogue. Among the Paharia and Santhalis of eastern Bihar, the tubers, crushed with the roots of *Panicum repens* (*Poaceae*), are taken internally to relieve rheumatoid arthritis. The tubers yield an essential oil that has antibiotic properties.

References

Asolkar *et al.* (1992), Bhatt and Mitaliya (1999), Chopra *et al.* (1956, 1969), Kirtikar *et al.* (1935), Kumar and Goel (1998), Sivarajan and Balachandran (1994), Yoganarasimhan (1996).

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Dilleniaceae

Dillenia indica L.

Botanical synonym

Dillenia speciosa Thunb.

Common names

Bengali: chalita, chalta, hargesa, ruvya; ***English***: dillenia, elephant apple; ***Gujarati***: karambal, karmal, otaphal; ***Hindi***: chalta, gilnar, girnar; ***Kannada***: bettakanigala, gangalu, kadkanagula, kanigala, muchira, neyitaku; ***Konkani***: corombol; ***Malayalam***: chalita, punna, syalita, valapunna; ***Marathi***: karambel, karmal, kota, motakarmal, motakarmbal; ***Oriya***: chalota, ou, rai, uau, uvu; ***Sanskrit***: bhavya; ***Tamil***: akku, ugakkay, uva, uvatteku; ***Telegu***: kalinga, peddakalinga, uvya.

Description

An attractive medium-sized to large, evergreen tree with reddish-grey bark, generally 10–25 m tall with a dense rounded crown; bark surface smooth, orange-brown to dark orange, peeling off in small scales. Leaves simple, grouped at the end of branchlets, oblong-lanceolate, 15–35 cm long and 5–12 cm wide, coriaceous, pubescent beneath, margins slightly to distinctly dentate; parallel-nerved from midrib; petioles 2–4 cm long, sometimes to 10 cm long. Flowers large, solitary, 12–20 cm in diameter, white, fragrant; sepals 5, orbicular,

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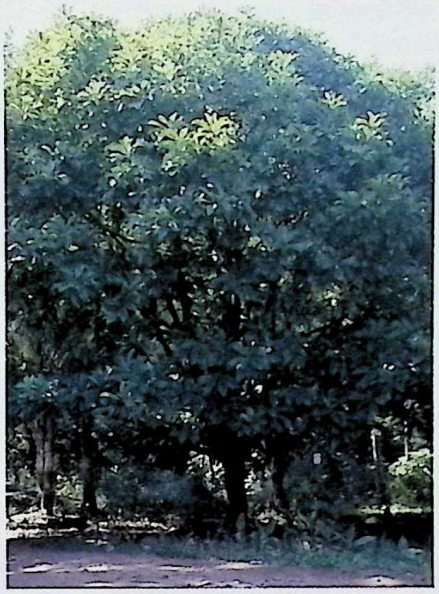
thick, fleshy; petals oblong. Fruits large, 7–15 cm in diameter, hard, consisting of 5 closely fitting sepals enclosing numerous compressed, reniform seeds with hairy margins embedded in a glutinous, edible pulp. Flowers between May and August and fruits ripen from September to February within its Indian range.



Distribution and habitat

Occurs naturally from India and Sri Lanka eastwards through Myanmar (Burma), Thailand, Indochina, southern China, peninsular Malaysia, Sumatra, Java and Borneo in tropical evergreen or rain forests. It is found wild in the moist and evergreen forests of the sub-Himalayan hills from Kumaon and Garhwal eastwards to Assam and Bengal, and southwards through peninsular India. It commonly grows on the banks of forest streams, and is cultivated in gardens for its handsome foliage and attractive flowers.

Medicinal properties and uses

The fruit reportedly has tonic properties and acts as a mild laxative. It is used in Ayurvedic practice to relieve abdominal pains. The juice of the fruit, mixed with sugar and water, is used as a cooling beverage in fevers and as a cough mixture. The bark and leaves are astringent.

References

Asolkar *et al.* (1992), Chatterjee and Pakrashi (1992), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935).

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Dioscoreaceae

Dioscorea bulbifera L.

Botanical synonym

Dioscorea sativa auct. non L.

Common names

Bengali: banalu, chamalu, gaichaalu, kukuralu, suralu; ***English***: bulb-bearing yam; ***Gujarati***: salvinavelya, suariya, varahikanda; ***Hindi***: agitha, karukanda, pitaalu, ratalu, suaralu; ***Kannada***: heggenasu; ***Konkani***: karando; ***Malayalam***: kattukachil; ***Marathi***: dukarakanda, gathalu, karukarinda, mataru; ***Oriya***: pita alu; ***Punjabi***: zaminkhand; ***Sanskrit***:: varahi, varahikanda; ***Tamil***: kattukkilangu, kodikilangu, pannukilangu; ***Telegu***: chedupaddudumpa, malakakayapendalamu; ***Urdu***: zaminekand.

Description

A large unarmed annual climber with glabrous stems twining to the left (clockwise). Tubers solitary, very variable in size and shape, from globose to pyriform, usually small and rounded, but up to 1 kg under cultivation; skin purplish-black or earth-coloured, usually covered with small feeding roots; flesh white to lemon yellow, mucilaginous. Leaves usually alternate, simple, 7.5–25 cm long and 7.5–10 cm wide, broadly ovate-cordate, apex acuminate, lobes rounded, basally 7–12-nerved joined by parallel cross-nerves. Bulbils numerous, borne in leaf axils, variable in shape, usually about 2.5 cm across, brown, warted. Flowers greenish or purplish, borne in axillary clusters on spikes 5–10 cm (male) or 10–25 cm (female) long. Fruits (capsules) oblong, triquetrous, fleshy, 1.8–2.2 cm long; seeds winged at the base. In central India flowering occurs between July and September and fruiting from October to December.

Distribution and habitat

Native to moist and wet forests of the Old World tropics from West Africa to the

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Pacific Islands. Common throughout India to an altitude of 1850 m in the Himalayas. Of the approximately 10 recognized varieties, several are cultivated in India, the most important being var. *kacheo*, var. *suavior*, var. *birmanica* and var. *sativa*.

Medicinal properties and uses

In Ayurveda, the tuber is considered bitter, pungent, tonic, alterative, aphrodisiac, stomachic and anthelmintic, and is prescribed for dyspepsia, urinary discharges, leucoderma, bronchitis, biliousness, tumours and strangury. In Unani medicine it is considered expectorant, astringent to the bowels, and useful for treating asthma, bronchitis and abdominal pains. The dried and powdered tubers are used as an external application for ulcers. They are also used to treat piles and dysentery. The bulbils of the wild varieties are used externally to promote healing of sores.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

Dioscorea hispida Dennst.

Botanical synonym

Dioscorea daemona Roxb.

Common names

Hindi: baichandi, karukanda; ***Malayalam***: podava-kilangu; ***Marathi***: baichandi, bhuikand; ***Sanskrit***: hastyaluka; ***Tamil***: peiperendai; ***Telegu***: pedumpa, pulidumpa, tellaginigeddalu.

Description

A biennial climber with a more or less prickly stem twining to the left (clockwise). Tubers more or less depressed-globose, often lobed, sometimes slightly elongated, up to 35 kg, borne close to the surface of the soil; skin straw-coloured to grey; flesh white to lemon yellow. Leaves alternate, trifoliate, petioles 10–20 cm long, usually prickly; leaflets 10–20 cm long and 5–13 cm wide, broadly cuneate-obovate, apex cuspidately caudate-acuminate, base tapering, petiolules 0.3–1.6 cm long, broadly cuneate-obovate, apex caudate-acuminate, base tapering, 3–5-nerved. Bulbils absent. Male flowers borne in dense cylindrical spikes 6–8 mm long in clusters along a more or less prickly, pubescent or villous rachis 15–60 cm long, bracts broadly ovate-deltoid at apex, shorter than flowers, perianth *c.* 3 mm across, lobes broadly oblong or suborbicular, usually rounded; female flowers borne in solitary spikes. Fruits (capsules) 5 cm long and 2.5 cm in diameter, triquetrous, rounded at both ends, smooth; seeds 3.2 cm long, wing *c.* 2.2 cm long and 1.3 cm wide, membranous, oblong, obtuse, broader than the flat, oblique nucleus. In central India flowering occurs between July and September and fruiting from September to December.

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Distribution and habitat

Native to tropical Asia, found in moist and wet forests from India to Taiwan, the Philippines and New Guinea. In India it occurs throughout most of the more humid parts of the country to an altitude of about 1200 m in Sikkim and the Khasi Hills (Meghalaya), in humid habitats of peninsular India to an elevation of about 300 m in the Eastern and Western Ghats; rarely cultivated.

Medicinal properties and uses

The tuber is reportedly used externally to promote healing of ulcers and to kill worms in infected wounds. In Ayurveda, the tuber is used externally as a substitute for that of *Dioscorea bulbifera*.

Warning

The flesh of the tuber is poisonous; its milk is used with the juice of *Antiaris toxicaria* (*Moraceae*) as an arrow-poison.

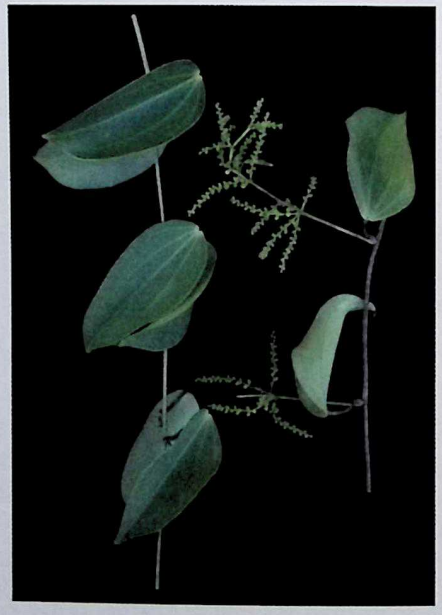
References

Asolkar *et al.* (1992), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

Dioscorea oppositifolia L.

Common names

Kannada: bellarai, inasara, nirbatte, tabinere; ***Malayalam***: kanji; ***Oriya***: gourobi, pittale; ***Sanskrit***: amlardraka, sarpakkya; ***Tamil***: kavala-kodi, thavaikachchu, venilai valli, vettilaivalli; ***Telegu***: adairdumpa, adavidumpatige, aretegalu, avatengatige, chenchudampa, yellagadda.



Description

A large climber with glabrous or finely pubescent stems twining to the right (anti-clockwise). Tuber usually single, 30–60 cm long, descending deep into the soil, cylindrical with a few rootlets; skin reddish; flesh white, soft, edible. Leaves simple, opposite or subopposite, rarely alternate, glabrous, coriaceous, 5–13 cm long and 2.5–7.5 cm wide, variable in shape, apex acuminate or rounded, margins well-defined and cartilaginous, base rounded, with 3–5 prominent nerves; petioles 0.6–3.2 cm long. Bulbils absent. Male flowers small, borne in dense, short-stalked axillary spikes 1–3.2 cm long, fascicled along a slender axillary rachis 10–25 cm long; female flowers in distant, solitary or fasciculate spikes 15–20 cm long. Fruits (capsules) suborbicular, 2.5–3.5 cm in diameter; seeds orbicular, 2–2.5 cm in diameter with a large membranous wing surrounding the nucleus. In central India flowering occurs mainly in September and October and fruiting in November and December.

Distribution and habitat

Native to southern India and throughout the hills of peninsular India at elevations between 150 and 1600 m; also found in Sri Lanka.

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Medicinal properties and uses

The ground, heated tubers are used as an external application to relieve swellings. The plant is reportedly also used to relieve sores, orchitis, epididymitis and dysentery.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935).

Dioscorea pentaphylla L.

Botanical synonym

Dioscorea jacquemontii Hook. f.

Common names

Bengali: suar alu, suaria alu, sur alu; ***English***: Fiji yam, kawan yam; ***Hindi***: bhusa, bursa, gazaria, kanta alu, phal alu, suarkand, tena; ***Kannada***: kaadugumbala, nuraigenasu; ***Malayalam***: chaval, kattunurunnakilannu, kornapidan, nuraigenassu, nuran, nurunnakilangu; ***Marathi***: babra, chatavali, manda, mandi, ulasi; ***Oriya***: konta alu; ***Sanskrit***: kantakalu; ***Tamil***: chedukundi, kattukkillangu, kattuvalli, nurangilangu, vallikodi, vellaikodi; ***Telegu***: adaviginisutiga, dukapendalam, karuchemba, moyakkupendalam, nuludumpa, pendimukatiga.

Description

A tall, slender climber with stems twining to the left (clockwise), prickly towards the base. Tubers usually single, very long (1.5–1.8 m), texture and shape variable; skin brown, yellow or purplish; flesh firm in ovoid tubers covered with bristly roots and soft in elongated tubers with few roots; pale cream or lemon yellow with purple flecks. Leaves alternate, 3–5-foliate, glabrous or pubescent beneath, petioles 2.5–6.3 cm long; leaflets variable in size and shape, elliptic-lanceolate, ovate or obovate, apex acuminate, cuspidate or subcaudate, base usually acute, petiolules very short; not basally nerved. Bulbils globose or cylindrical, usually numerous, in leaf axils. Male flowers pale greenish, fragrant, in 2.5–3.8-cm-long racemes that are solitary or in fascicles along hairy branches of a 15–30 cm long panicle; female flowers in axillary, pendulous pubescent spikes 5–15 cm long. Fruit (capsule) triquetrous,

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2–2.5 cm long, glabrous or pubescent; seeds 1.3–2 cm long, including the membranous wing at the base. About 16 varieties are recognized, distinguished by their tuber characteristics. In central India flowering occurs between August and October and fruiting from October to January.

Distribution and habitat

Native to tropical Asia from India to Polynesia; also occurs in parts of tropical Africa. It is found throughout most of India to an altitude of 1700 m in the Himalayas and 1200 m in the Eastern and Western Ghats; fairly common in hill forest localities in peninsular India.

Medicinal properties and uses

The tuber is reportedly used as an external application to disperse swellings, and also as a tonic. Its decoction is used externally to relieve rheumatism. In Ayurveda, the tuber is used externally as a substitute for that of *Dioscorea bulbifera*.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

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Dipterocarpaceae

Shorea robusta Gaertn. f.

Common names

Bengali: sakhu, sal, sala, salwa; ***English***: sal, Indian dammer; ***Gujarati***: ral, rala (resin); ***Hindi***: sakhu, sal, sala, shal; ***Kannada***: asina, guggula, kabba (resin), sarja, vamsa; ***Malayalam***: maramaram (resin), mulappumarutu; ***Marathi***: guggilu, ral, rala (resin), sajara; ***Oriya***: sagua, sal, salwa, sekwa, soringhi; ***Punjabi***: sal, seral; ***Sanskrit***: sala, salah; ***Tamil***: attam, kungiliyam (resin), shalam; ***Telegu***: gugal, guggilamu (resin), sarjamu; ***Urdu***: ral.

Description

A large, semi-deciduous tree, usually attaining a height of 18–30 m and a stem diameter of 0.6–0.7 m. Bark reddish-brown or grey, smooth or longitudinally fissured. Leaves 10–30 cm long and 5–18 cm wide, ovate-oblong, coriaceous, lustrous when mature. Flowers hairy, soft, small, borne in axillary or terminal lax panicles, yellowish. Fruit indehiscent, 10–15 cm long, 1–1.5 cm long and 1 cm in diameter, ovoid, reddish to pale yellowish-green in colour, 1-seeded with 5 somewhat unequal 5–7 cm long, winglike, persistent sepals. Seeds ovoid, with fleshy, unequal cotyledons. Flowers in March and April; fruits mature between May and July; in central India trees remain leafless for a short period between February and April.

Distribution and habitat

A gregarious species, found extensively over a wide range of site conditions and climatic regimes up to 1700 m elevation, in the sub-Himalayan tract from Punjab to Assam, southwards through West Bengal, Bihar and Orissa into Andhra Pradesh and Madhya Pradesh.

Medicinal properties and uses

In Ayurveda the leaves are considered anthelmintic and alexiteric; they are used

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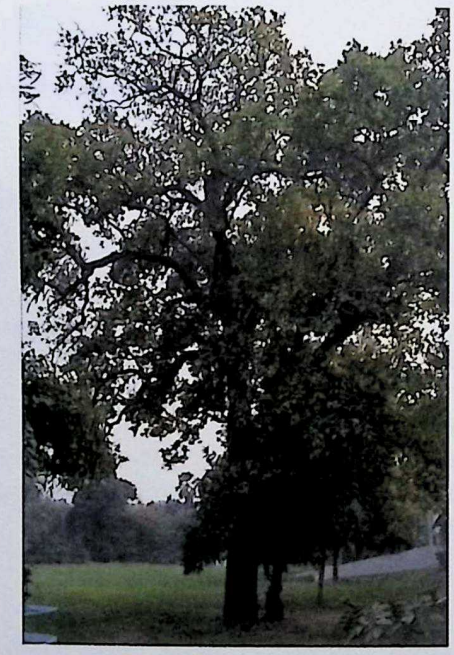
to treat wounds and ulcers, itching, leprosy, gonorrrhoea, cough, earache and headache. The oleoresin exuded from the cut bark has astringent and detergent properties, and is used to treat diarrhoea, dysentery and vaginal discharges, to promote healing of wounds, ulcers, fractures, and to relieve burns and itching. In Unani medicine the resin is considered useful for treating menorrhagia, enlargement of the spleen, and as a collyrium for relieving eye irritations. It is also used as an ingredient of ointments for skin diseases and in ear troubles. The powdered stem bark or bark paste is applied to stop bleeding and promote healing of cuts among the tribal inhabitants of southern Bihar and the Kondhs of southwestern Orissa. It is reputed to be an aphrodisiac and useful for the treatment of gonorrhoea. A paste made from the fruits is sometimes used to treat diarrhoea. The tree yields a valuable timber, and the resin (known commercially as *sal dammar* or *Bengal dammar*) is widely used in India as an incense, for caulking boats, and the production of inferior quality paints and varnishes.



References

Chatterjee and Pakrashi (1992), Chopra *et al.* (1956), CSIR (1948–1992), Girach (1992), Girach and Aminuddin (1995), Kirtikar *et al.* (1935).

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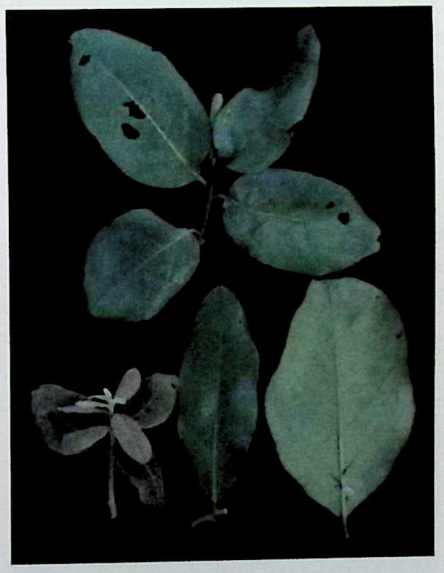
Ebenaceae

Diospyros melanoxylon Roxb.



Botanical synonyms

Diospyros dubia Wall. ex A. DC., *D. exsculpa* Bedd., *D. melanoxylon* var. *beddomei* Clarke, *D. wightiana* A. DC.

Common names

Bengali: kend, kendu, kiu; ***English***: Coromandel ebony, Malabar ebony, persimmon ebony; ***Gujarati***: tamrug, tamruj, timburni, tumri; ***Hindi***: abnus, kendu, tendu, timburni; ***Kannada***: abanasi, balai, kari, mallali, tumari, tumburasu; ***Konkani***: tumri; ***Malayalam***: kari; ***Marathi***: kakatembhurni, tembhurni, temru, tendu, timbruni, tumri; ***Oriya***: kend, kendu; ***Sanskrit***: dirghapatraka, kenduka; ***Tamil***: karai, karundumbi, tumbi, tumbili; ***Telegu***: manjigata, nallatumki, thumbi, thumki, tumi, tumki; ***Urdu***: abnus.

Description

A deciduous tree usually up to 15 m tall; bark dark grey or black, deeply fissured with transverse and longitudinal cracks, exfoliating in rectangular scales; branchlets, young leaves and inflorescence covered with soft, grey or tawny tomentum. Leaves alternate, opposite or subopposite, coriaceous, glabrous above and tomentose or pubescent beneath, 6.3–15 cm long and 2.5–7 cm wide, elliptic or elliptic-oblong, apex obtuse or

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subacute, base acute or rounded; main nerves 6–10 pairs with reticulate veins between; petioles 6–8 mm long. Male flowers yellowish, borne in short, 3–12-flowered, drooping axillary or subaxillary cymes longer than the petioles; calyx campanulate, 4–6 mm long, hairy on both sides, lobes 4–6, shorter than the tube, subacute; corolla more or less tubular, about twice as long as calyx, pubescent outside, glabrous inside, lobes 4–6, broadly ovate, acute, linear-oblong, acuminate. Female flowers solitary, calyx hairy on both sides, corolla as in the male. Fruit (berry) globose, pubescent when young, smooth and yellow when ripe, to 3.5 cm across; seeds 4–8, compressed, oblong, curved, brown, shiny, surrounded by a yellow, sweet, slightly astringent pulp. In central India, where flowering occurs between April and June and fruits mature the following April–May, the tree loses its leaves for a short period between April and June.

Distribution and habitat

Common in most deciduous forests and on dry, rocky hills in peninsular India from Bihar and Madhya Pradesh southwards to Karnataka and Tamilnadu to an elevation of about 900 m. Its best growth is attained in valleys on black soils in central India.

Medicinal properties and uses

The fruit is carminative and astringent. The fruit pulp, pounded with the twigs of *Sarcostemma acidum* (*Asclepiadaceae*), is applied externally to promote healing of bone fractures by the Gonds and Kolams in northern Andhra Pradesh. The leaves are diuretic, carminative, laxative and styptic. The juice of the young, tender leaves is taken orally to treat diarrhoea in southern Orissa. Dried flowers are reportedly useful for treating various urinary, skin and blood diseases. A decoction of the astringent bark is used for relieving diarrhoea and dyspepsia and as a tonic. A dilute extract of the bark is used as an astringent lotion for the eyes. The pounded roots mixed with those of *Achyranthes aspera* (*Amaranthaceae*) and water, are given for treatment of fever among the tribal inhabitants of southern Bihar. The leaves are commonly used for rolling *bidis* (local cigarettes).

References

Asolkar *et al.* (1992), Chatterjee and Pakrashi (1995), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Girach and Aminuddin (1995), Kirtikar *et al.* (1935), Mohanty *et al.* (1996), Ravisankar and Henry (1992).

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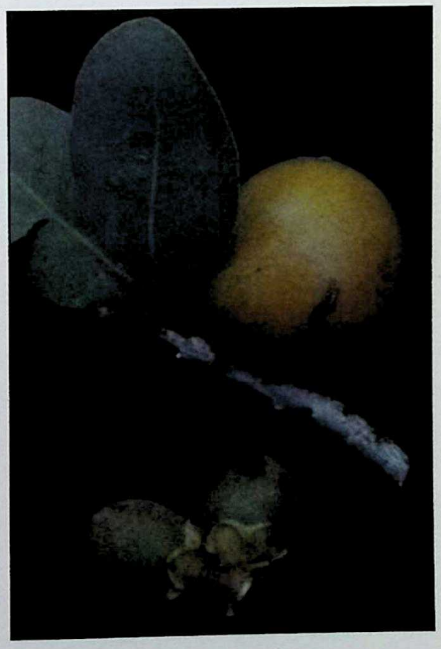
Diospyros montana Roxb.



Botanical synonyms

Diospyros calcarea Fletcher, *D. cordifolia* auct. (non Roxb.) Thw., *D. diversilimba* Merr. & Chun, *D. ebenum* Retz., *D. montana* var. *montana* (Roxb.) Hiern

Common names

Bengali: bangab; ***English***: mottled ebony, mountain persimmon; ***Gujarati***: timbarao; ***Hindi***: bistendu, dasaundu, lohari, tendu; ***Kannada***: balagunike, balkunike, jagalagante, kadubalekayi, kalagunda, tendu, vankane; ***Konkani***: goinda; ***Malayalam***: bali; ***Marathi***: goindu, govindu, lohari, tembhurni, timru, tumru; ***Oriya***: bhodrika, gaurokoshayo, halda, koshakholi, kossekuli; ***Punjabi***: hirek, kendu, pasendu, temru; ***Sanskrit***: tumala; ***Tamil***: kuruttualisu, vakkanai, vakkanatam, vellaittuvarai, velvakkanai; ***Telegu***: goddigattu, jagadagondi, michatummurra, muchitanki, pudumaddi, verragada.

Description

A shrub or small tree up to 15 m tall, evergreen or partly deciduous in dry habitats; bole and branches sometimes with long, hard, stiff spines; bark smooth, grey to yellowish-grey, peeling in old trees; young twigs hairy. Leaves alternate, ovate-oblong or elliptic, 1.5–15 cm long and 1–7.5 cm wide, acute or subacuminate at apex, rounded or subcordate at base, pubescent when young, becoming glabrescent; petioles slender, 2.5–7.5 mm long. Male flowers white or yellow to greenish, 1 cm across, borne in pubescent cymes; peduncles 5–13 mm long, pedicels very short; calyx 5 mm long, lobes ovate, acute, ciliate; corolla urn-shaped, glabrous, lobes oblong, obtuse. Female flowers white, solitary, 1.3 cm long and 2 cm across the calyx; peduncles 3.7–7.5 mm long, nodding; calyx 1.3 cm long, puberulous, lobes elliptic, obtuse, ciliate; corolla slightly larger than in the male. Fruit (berry) globose or ovoid, usually acute and apiculate at apex, 0.8–3 cm in diameter, glabrous, reddish-brown when ripe; seeds up to 8, semi-wedge-shaped, black, smooth, up to 0.8 cm long. In central India flowering occurs from March to May and fruits ripen from November to January.

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Distribution and habitat

Native from India and Sri Lanka eastwards through peninsular Southeast Asia to Indonesia, the Philippines and northern Australia in seasonally dry forests. It is found throughout most of India in deciduous forests, though rarely common.

Medicinal properties and uses

The bitter fruit pulp, which has an unpleasant odour, is applied externally to relieve boils. The bark, made into a paste, is given with rice to relieve swelling of the body by the inhabitants of Gandhamardan Hills in Orissa. Among the Paharia and Santhalis of eastern Bihar, the extract of the fresh bark is given to relieve stomach-ache. In Ayurveda, the bark, fruit, seeds and seed oil are used medicinally as substitutes for those of *Diospyros malabarica* for the treatment of boils, leucorrhoea, dysentery, blood disorders, haemorrhage, polyuria, urticaria, intermittent fever and snake-bite poisoning.

Warning

The fruit pulp is poisonous and should not be taken internally.

References

Brahmam and Saxena (1990), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Kumar and Goel (1998), Yoganarasimhan (1996).

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Elaeagnaceae

Elaeagnus latifolia L.

Botanical synonyms

Elaeagnus conferta Roxb., *E. kologa* Schldl.

Common names

Bengali: guara; ***Hindi***: ghiwain; ***Kannada***: gunnamada patte balli, haligeballe, hejjala, huliga, hunaseballi; ***Malayalam***: kayalampuvalli; ***Marathi***: ambgul, nildook, nurgi; ***Oriya***: dibaguda, pihta; ***Tamil***: kolungai, kulangi, kulari.

Description

A straggling shrub, climber or small tree, very variable in habit, stem and branches sometimes spiny; bark smooth with corky excrescences; young shoots with shiny, rust-coloured scales. Leaves broadly elliptic to elliptic-lanceolate, 3.8–10 cm long and 2.2–6 cm wide, apex rounded to acuminate, base cuneate to rounded, green above, with prominent silvery-white (and a few rusty) scales beneath; petioles 0.6–1 cm long, scaly. Flowers straw-coloured with silvery-scaled pedicels, borne in axillary clusters; perianth 8 mm long, covered with silvery scales, lobes ovate, acute, 3 mm long, spreading. Fruit ellipsoid, 2–4 cm long, 8-ribbed, crowned by the top of the perianth, red or orange-red with whitish spots when ripe, mesocarp succulent, edible; seeds 2 cm long. Flowers and fruits from November to March.

Distribution and habitat

Widely distributed in hill forests throughout India and elsewhere in tropical Asia; common in evergreen and semi-evergreen forests of the Western Ghats above 1500 m elevation and in the Bababuda Hills of southern Karnataka.

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Medicinal properties and uses

The flowers are considered cardiac and astringent in Sind and Punjab. The edible ripe fruits are astringent, with a pleasantly acid and refreshing taste.

References

Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

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Erythroxylaceae

Erythroxylum monogynum Roxb.

Botanical synonyms

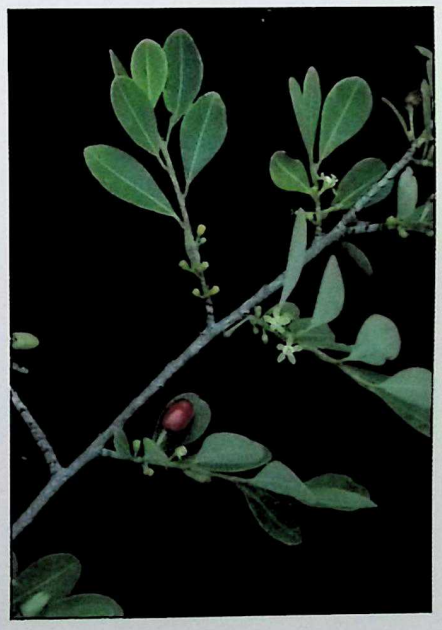
Erythroxylum indicum (DC.) Bedd., *Sethia indica* DC.

Common names

Bengali: huli; ***English***: bastard sandal, red cedar; ***Kannada***: adavigorante, devadaru, devadhari, gandhagiri, kuruvakumara, sambuliayi; ***Malayalam***: devataru; ***Tamil***: devadaram, chemanatti, sempulicham; ***Telegu***: adivigoranta, devadari, devadaru, gadara, pagadapukatta, paribhadrakamu.

Description

A shrub or a small tree, 2–7.5 m tall, with rough, dark brown bark; branches with deciduous bracts at the base. Leaves simple, alternate, 1.4–5 cm long and 0.7–2.5 cm wide, cuneate, obovate or elliptic (or cuneate-obovate), apex rounded or very obtuse, emarginate, margins entire, slightly recurved at base, glaucous, sometimes brown beneath; nerves oblique, much reticulated; petioles 0.3–0.7 cm long; stipules semi-amplexicaul, triangular, to 2 mm long, finely serrate, between petioles. Flowers white or greenish-white, scented, about 1 cm across with a campanulate calyx, solitary or in 2–4-flowered fascicles 5–10 cm long. Fruit an oblong, cylindrical drupe about 1 cm long, bright scarlet, smooth and edible when ripe.



Distribution and habitat

Found in dry evergreen forests of peninsular India and in Sri Lanka, to an altitude of about 925 m. Flowers and fruits between August and February in southern India and Sri Lanka.

Medicinal properties and uses

An infusion of the wood and bark is considered stomachic, diaphoretic and diuretic; it is used to treat mild cases of

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dyspepsia. Among the tribal inhabitants of Prakasam District in southern Andhra Pradesh, an extract of the leaves mixed with curd (yoghurt) is taken to kill intestinal worms. A decoction of the leaves is used to relieve malarial fevers. The leaf juice is administered orally in the treatment of jaundice among the Kolams of Andhra Pradesh. The dark brown heartwood has a very pleasant scent, and is valued for turnery. A crude oil obtained by destructive distillation of the wood is used in Sri Lanka as a timber preservative. The leaves of the plant are edible.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935), Ravisankar and Henry (1992), Vijaya Kumar and Pullaiah (1998), Yoganarasimhan (1996).

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Euphorbiaceae

Acalypha fruticosa Forssk.

Botanical synonym

Acalypha betulina Thw.

Common names

English: birch-leaved acalypha; ***Hindi***: chinni, chinnikajhar; ***Kannada***: chinni, chinnimara; ***Malayalam***: sinnimaram; ***Tamil***: kuppamani, kuppameni, sinni, sinnimarum; ***Telegu***: chinni, chinniaka.

Description

A strong-smelling, pubescent, annual bushy shrub up to 2.5 m tall, covered with yellow and waxy glands. Leaves 2–4.8 cm long and 0.9–3.2 cm wide, narrowly ovate-lanceolate to rhombic-ovate, base acute to broadly obtuse, apex acute or acuminate, margins crenate-serrate, glabrous with widely scattered yellowish glands beneath; petioles 0.5–2.8 cm long, white-pubescent; stipules 1.5–2 mm long, narrowly lanceolate, pubescent. Inflorescence spicate, axillary, pubescent and gland-dotted; male flowers crowded in small clusters towards apex, female flowers below; bracts minute, enlarging to 3 mm wide and 10 mm long in fruit. Fruits (capsules) densely tomentose; seeds smooth. Flowers and fruits almost year-round.

Distribution and habitat

Widely distributed in tropical Africa, India, Sri Lanka, Myanmar (Burma) and Java. Found in southern India from Orissa to Tamilnadu, Karnataka and Kerala, commonly in dry, exposed habitats and as a weed in gardens and cultivated fields.

Medicinal properties and uses

The leaves are considered attenuant, alterative and stomachic; their infusion is used to treat dyspepsia, colic and diarrhoea, and as a vulnerary to wash pustules. The leaf juice is used to treat ophthalmia. The root is reportedly used to treat gonorrhoea.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935).

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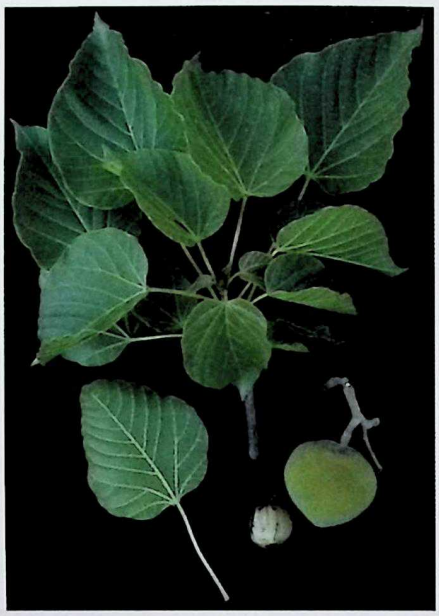
Aleurites moluccana (L.) Willd.



Botanical synonyms

Aleurites triloba J.R. & G. Forst., *Jatropha moluccana* L.

Common names

Bengali: akola, akrot, jangli akrot; ***English***: Belgaum walnut, candlenut tree; ***Gujarati***: akhoda; ***Hindi***: akola, akrot, jangliakrot; ***Kannada***: akroda, nandu akrotu, natakrodu; ***Malayalam***: akkrottu, akshotam, karankolam; ***Marathi***: akhod, japhala; ***Oriya***: akuroto; ***Sanskrit***: akshota, asphotaka, askhota, phalasneha; ***Tamil***: nattakkarottu; ***Telegu***: akharu, natakrotut; ***Urdu***: akharut.

Description

An evergreen tree up to 20 m tall; shoots and young leaves stellately hairy. Leaves crowded at the ends of branches, 7–18 cm long and 4–12 cm wide, variable in shape from ovate to lanceolate or broadly rhomboid, obtusely or acutely 3–7-lobed, base obtuse or truncate; petiole 4.5–15 cm long, with a pair of glands at the point of attachment with leaf blade. Flowers white, with short pedicels, borne in dense tomentose cymes up to 15 cm long; calyx 2.5 mm long, splitting into 2 or 3 lobes; corolla longer, 1.3 cm across. Fruits 4–7 cm in diameter, subglobose, fleshy, smooth, olive-coloured, containing 1–2 large, ovoid, smooth brown seeds or nuts about 2.5 cm long, with a furrowed testa.

Distribution and habitat

Probably native to Malaysia and the Pacific islands, but widely planted throughout the tropics. In India it is planted in gardens and is occasionally naturalized, especially in southern India and in Assam.

Medicinal properties and uses

In Ayurveda, the fruit is considered tonic and aphrodisiac and useful for treating diseases of the heart and blood. In Unani medicine it is also considered carminative and expectorant, and is used to treat piles, hydrophobia and ringworm. The bark and flowers are used to treat asthma, sores, ulcers and tumours, and as a laxative. The seeds are used as a laxative; the seed oil is used as a substitute for castor oil as a purgative.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

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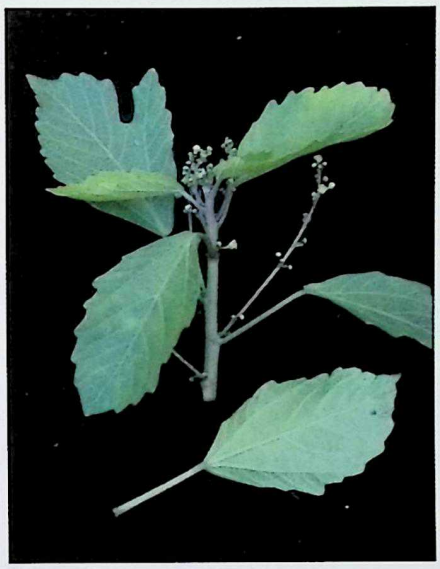
Baliospermum montanum (Willd.) Muell. Arg.

Botanical synonyms

Baliospermum axillare Bl., *B. polyandrum* Wight, *Jatropha montana* Willd.



Common names

Bengali: danti, hakum, hakun; ***Gujarati***: dantimul, jamalagota; ***Hindi***: danti, hakum, hakun; ***Kannada***: danti, kaduharalu, naagadanti; ***Malayalam***: dantika, katalavanakku, nakadanti, nervalam; ***Marathi***: danti; ***Oriya***: banjado, donti; ***Punjabi***: dant, hakun; ***Sanskrit***: danti, nikumbha, udumbaraparni; ***Tamil***: kattamanakku, niradimuttu, peyamanakku; ***Telegu***: adaviaamudamu, ettadundiga, kanakapata, kondamudamu, nelajidi.

Description

A stout shrub, 0.9–1.8 m tall, with many shoots arising from the base; bark light brown. Leaves alternate, very variable in shape; upper leaves small, lanceolate; lower leaves large, up to 30 cm long and 25 cm wide, ovate, palmately lobed and sinuately toothed, 3–5-nerved at base; petiole 2–15 cm long, hairy, with a pair of stipular glands at the apex. Flowers small, greenish-yellow, borne in axillary racemes or contracted panicles with either all male or male with a few female flowers in lower positions. Fruits (capsules) obovoid, 3-lobed, 0.8–1.3 cm long, usually hairy; seeds oblong, smooth, shiny, 0.6–0.8 cm long, mottled, with an oily endosperm. Flowers and fruits from November to March throughout central India.

Distribution and habitat

Common in fields, waste places, and in shady habitats in disturbed deciduous and semi-evergreen forests throughout most of India up to 1000 m altitude in the Himalayas and 1800 m in the Western Ghats.

Medicinal properties and uses

The black, thick-barked roots are used in Ayurvedic medicine either alone or in combination with other plant drugs; they are considered pungent, heating, anthelmintic, diuretic and useful for treating skin diseases, piles, wounds, jaundice, dropsy and enlarged spleen. It is an ingredient of the Ayurvedic preparation *Dasamula panchakoladhi kashayam*, used for treating ascites. The powdered roots are taken internally to relieve indigestion among the Paudi Bhuinya in northern Orissa. The leaves are purgative and are also used for treating dropsy and as a poultice for wounds. A decoction or infusion of the leaves is used to treat asthma. The latex exuded from the cut stem and branches is used by tribal people in Andhra Pradesh to relieve body-ache and joint pains. The seed oil is reportedly hydrogogue and cathartic; it is used externally to relieve rheumatism.

Warning

The powdered seeds act as a drastic purgative and can be poisonous to adults in doses larger than one seed.

References

Aminuddin and Girach (1996), Asolkar *et al.* (1992), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

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Breynia retusa (Dennst.) Alston

Botanical synonyms

Breynia patens (Roxb.) Benth., *Melanthesa retusa* Kostel., *Phyllanthus patens* Roxb., *P. retusus* Dennst., *P. turbinatus* Koen ex. Roxb.

Common names

Bengali: chitki; ***Gujarati***: kamboi; ***Hindi***: kalamahomad, kambhi, kedakamboi, khedakamboi; ***Malayalam***: peruniruri; ***Marathi***: kalichikali, kangli; ***Oriya***: deulopohora, jajan, jajanga, medhokotahotoru; ***Sanskrit***: bahupraja, kamboji; ***Tamil***: pavalapulah; ***Telegu***: devadari.

Description

A graceful shrub up to 2 m tall, with smooth grey bark and slender, spreading branches. Leaves distichous, membranous, broadly elliptic to orbicular, apex obtuse, 0.9–3.5 cm long and 0.7–2 cm wide, black above when dry; main nerves 3–5 pairs; petioles 1–2 mm long, stipules 2.5–3.5 mm long, subulate from a triangular base, persistent. Flowers appearing with the young leaves, small, axillary on filiform pedicels, the male flowers in the lower and the female in the upper axils. Male flowers pale yellow, in fascicles of 1–3; calyx turbinate or campanulate, 2.5–4 mm long, faintly 6-lobed with alternate lobes smaller. Female flowers pale green, pedicels shorter than in the male. Fruits (capsules) to 0.8 cm in diameter, flattened at both ends, brilliant orange-red when ripe with an enlarged calyx, 6–12-seeded; seeds triquetrous, 6 mm long, blue-grey with orange-yellow aril.

Distribution and habitat

Commonly found in open forests and scrublands in the tropical Himalayas from Nepal to Manipur and in peninsular India to an elevation of 1500 m. Also native to Myanmar (Burma) and Sri Lanka.

Medicinal properties and uses

In Ayurveda the plant is considered astringent to the bowels and useful for treating inflammations and diseases of the blood; the juice of the stem is used to treat conjunctivitis. The leaves are used as a poultice to hasten suppuration of infected sores. In southern Orissa, the leaf bud or young leaf, ground into a paste and, mixed with sugar candy, is taken orally to relieve diarrhoea.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956), CSIR (1948–1992), Mohanty *et al.* (1996), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

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Breynia vitis-idaea (Burm. f.) Fischer

Botanical synonyms

Breynia rhamnoides (Willd.) Muell. Arg., *Rhamnus vitis-idaea* Burm. f.

Common names

Bengali: kali sitki, kamkata juli; ***English***: Indian snowberry; ***Hindi***: surasaruni, tikhar; ***Kannada***: bamari, billisulli, gandupachcheri, huli, kadunugge, kempuhuli, suli; ***Malayalam***: chuvannnaniruri, kattuniruri, pavalapulla, pavilappula; ***Oriya***: jajan; ***Sanskrit***: aruni; ***Tamil***: kattuniruri, manippulanji, manipulnati, pavalappula, sigappuppula; ***Telegu***: ettaballi, ettapurugudu, nagatipachchari, pagadapu, vellari, yellari.

Description

An attractive evergreen shrub or a small tree up to 3 m tall with yellowish-grey, rough bark and horizontal, flexuous branches; branchlets angular, smooth. Leaves alternate, distichous, elliptic to broadly ovate, apex obtuse to acute, base subacute or rounded, 1.7–6.2 cm long and 1–4 cm wide, pale beneath, dark brown or black when dry; petioles *c.* 2.5 mm long, stipules 1.5 mm long, subulate from a triangular base, persistent. Flowers small, greenish-yellow or pink, axillary. Male flowers in few-flowered fascicles; calyx turbinate or subcampanulate, mouth entire or obscurely lobed. Female flowers solitary, calyx cup-shaped, 6-lobed, lobes acute. Fruits (capsules) globose, to 0.6 cm in diameter, smooth, succulent, dull red or sometimes purple or white when ripe; seeds 3 mm long, without an aril. In central Indian deciduous forest regions, flowering occurs mainly in June and July, and fruiting in July and August.

Distribution and habitat

Found in tropical Asia from India and Sri Lanka to Malaysia, China and the Philippines. In peninsular India it is found chiefly in deciduous forests in open habitats and near stream-beds.

Medicinal properties and uses

The leaves are heated and applied as a poultice to hasten suppuration of infected sores. The leaf juice is given to women after childbirth to prevent haemorrhage; the astringent bark is also used for this purpose. The dried leaves are powdered and smoked like tobacco in parts of Bihar to relieve tonsillitis. In Ayurveda, the plant is reportedly used as a substitute for *Breynia retusa*.

References

Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

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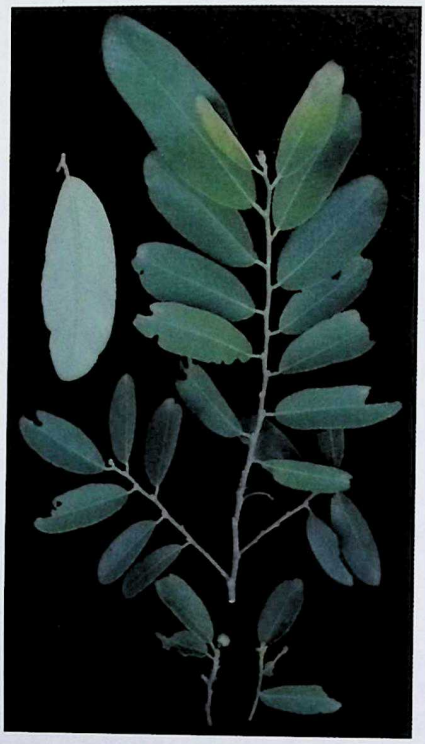
Bridelia montana (Roxb.) Willd.



Botanical synonym

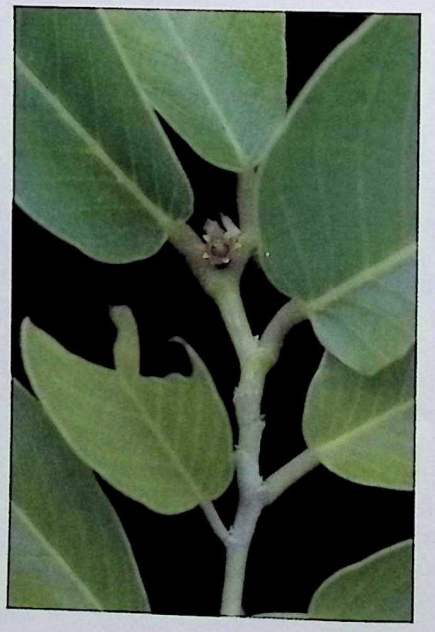
Bridelia hamiltoniana Wall.

Common names

Gujarati: asano; ***Hindi***: gondni, kargnalia; ***Kannada***: kittoe, sidigulige; ***Marathi***: asana; ***Oriya***: nuanali; ***Sanskrit***: asana, pasanabheda; ***Tamil***: vengaimaram; ***Telegu***: gundu bigalu, panchavoni, pantangi, pantegi, pantenga, sannakodari, tellavegisa.

Description

A large evergreen shrub or a small tree without thorns. Leaves up to 15 cm long and 9 cm wide, usually broadly ovate, apex rounded or sometimes acute, base rounded or narrowed, margins entire or undulate; petioles 2.5–7.5 mm long, swollen; stipules caducous. Flowers small, greenish-yellow, borne in small axillary clusters; calyx 2.5 mm long, segments erect; petals shorter than the sepals, obovate, keeled at the back, coarsely toothed in the male, nearly enclosing the ovary in the female flowers. Fruits ovoid, 0.6 cm long, greenish-white turning red or blackish when ripe.



Distribution and habitat

Found in the sub-Himalayan hills from Kashmir eastwards to Myanmar (Burma) to an altitude of 1800 m, in Bihar, Madhya Pradesh, and in dry forests of the Eastern Ghats in Orissa and Andhra Pradesh to an elevation of 900 m.

Medicinal properties and uses

The root and bark are much valued in traditional medicine in western peninsular India as an astringent. The plant is also credited with anthelmintic properties. In Sri Lanka it is reportedly used to treat bone fractures.

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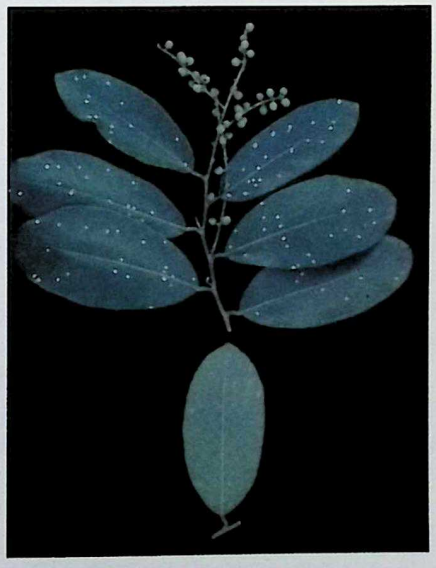
References

Asolkar *et al.* (1992), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

Bridelia retusa (L.) A. Juss.

Botanical synonyms

Bridelia cambodiana Gagnep., *B. pierrei* Gagnep., *B. spinosa* (Roxb.) Willd.



Common names

Bengali: geio, kantakoi; ***Gujarati***: asana, ekalakanto, monj; ***Hindi***: ekdania, gauli, gondai, kaj, karka, kasai, kassi, khaja; ***Kannada***: asana, garige, goje, komanji, kogyamunji, muljane; ***Konkani***: kongy; ***Malayalam***: charalu, komanji, mukkayini, mulluvaenga; ***Marathi***: asana, katiyen, kutki, monj, phataraphoda; ***Oriya***: kasi, kosi; ***Punjabi***: mark, pathor; ***Sanskrit***: asana, ekadivi, ekavira, mahavira; ***Tamil***: asavei, mullumaruthu, mulluvengai; ***Telegu***: bontha-yepi, koramaddi, verri karaka.

Description

A semi-deciduous shrub or medium-sized tree up to 18 m tall, young trees armed with strong conical thorns up to 7 cm long; bark grey or dark brown with longitudinal cracks, exfoliating in irregular flakes. Leaves alternate, 7.5–25 cm long and 3.8–6.3 cm wide, rigidly coriaceous, lanceolate to elliptic-oblong, margins entire or slightly crenulate, usually finely tomentose beneath; main nerves prominent, straight, 15–25 pairs; petioles 0.6–1.5 cm long. Flowers dioecious, small, yellow or greenish, borne in clusters on long axillary or terminal paniculate spikes; calyx greenish, tinged with red, 4 mm in diameter, glabrous, segments fleshy, triangular ovate, acute, spreading; petals

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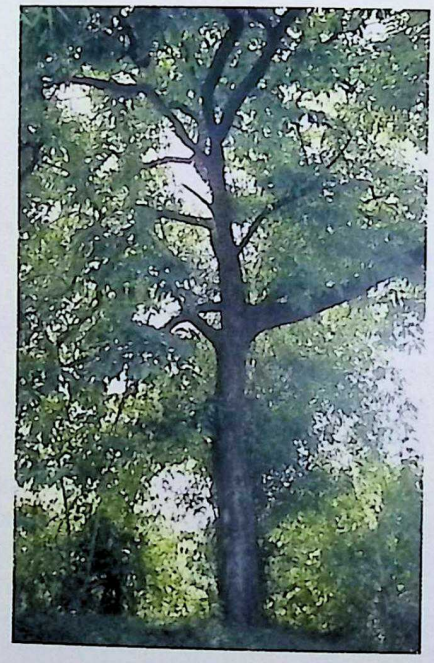
greenish-white, those of the male flowers obovate, those of the female flowers subspathulate. Fruits globose, fleshy, edible, 0.6–0.8 cm in diameter, seated on the persistent, slightly enlarged calyx, yellowish to purple-black when ripe, containing 1–2 seeds. In central India flowering occurs mainly from July to September and fruiting from November to January; the leaves turn reddish-brown before falling in March–April and are renewed in April–May.

Distribution and habitat

Native to India and Sri Lanka eastwards to Myanmar (Burma), Indochina, southern China, Thailand and northern Sumatra. Found in secondary deciduous and semi-deciduous forests throughout India except in very dry regions, often near streams or rivers, to an altitude of 1800 m.



Medicinal properties and uses

The stem bark is considered a valuable astringent. Mixed with gingelly oil (from seeds of *Sesamum orientale*: *Pedaliaceae*), it is used to relieve insect stings or as a liniment to relieve rheumatism. In pharmacological trials the bark exhibited antiviral and hypotensive properties. The powdered stem bark is given with water to relieve abdominal pain among the Bondo tribals of southern Orissa. Among the Bhils in Rajasthan, the stem bark is boiled and used as a vapour bath following childbirth for its reputed restorative and tonic action. They also use the leaves in the form of a paste as an external application for conjunctivitis. The edible fruits are used as a laxative, and to check vomiting in children. In Ayurveda the plant is considered pungent, bitter and heating, and useful for relieving pain in lumbago and sciatica; the bark is used for removing urinary concretions.

References

Aminuddin and Girach (1991), Asolkar *et al.* (1992), Chopra *et al.* (1956), CSIR (1948–1992), Joshi (1989), Kirtikar *et al.* (1935), Rajendra and Henry (1994), Yoganarasimhan (1996).

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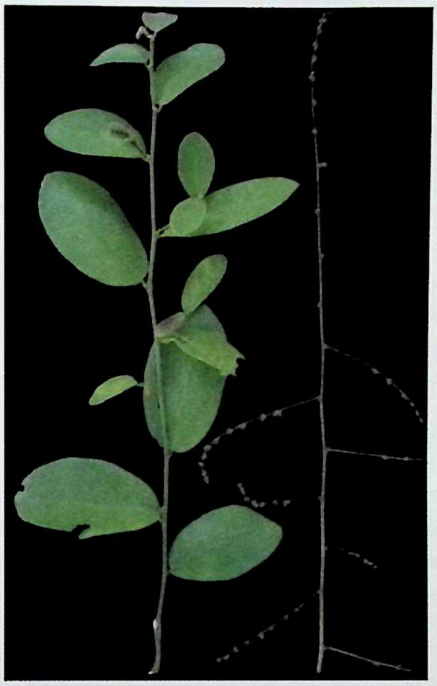
Bridelia stipularis Blume



Common names

Bengali: harinhara; ***Hindi***: kangiabel, khaji; ***Kannada***: bisalballi; ***Malayalam***: cheruka, panachi; ***Marathi***: asana, kantakauchi, kutki; ***Oriya***: gaurkarsi; ***Sanskrit***: ghonta.

Description

A large woody evergreen climber or straggling shrub with pendant branches armed with large, deflexed spines when young; bark grey, hard, deeply fissured. Leaves elliptic or obovate, obtuse or acute, crenate or entire, thinly coriaceous. Flowers greenish-yellow, borne in dense axillary heads arranged in leafy, paniculate spikes. Fruits (drupes) ovoid, succulent, smooth, bluish-black when ripe, edible, with a taste similar to those of *Phyllanthus emblica*.

Distribution and habitat

Found throughout tropical and subtropical India, Bangladesh and Myanmar (Burma), including the Himalayan foothills from Kashmir to Bhutan.

Medicinal properties and uses

A decoction of the bark is given to children to relieve cough, fever and asthma, and as a gargle to treat mouth sores. The fresh, tender leaves are used to treat jaundice; an emulsion of the leaves is reportedly used for anaemia during pregnancy.

References

Asolkar *et al.* (1992), CSIR (1948–1992).

Croton bonplandianum Baill.

Botanical synonym

Croton sparsiflorus Morong

Common names

None reported.

Description

An erect, woody, much-branched herb up to 50 cm tall. Leaves alternate or suboppo-site, 1.2–5.5 cm long and 0.2–3 cm wide, shortly ovate-lanceolate, apex acute, base cuneate, margins minutely serrate, glabrous above, sparsely stellate-hairy beneath, 3-veined at base with 2–4 pairs of lateral veins above; 2 small glands at base of leaf blade beneath; petioles 0.2–0.6 cm long, slender, stellate-hairy. Flowers small, white, male with 5 petals, female without, borne in terminal inflorescences 5–7 cm long. Fruit (capsule) oblong-ellipsoid, approximately 0.4 cm long and broad, shallowly 3-lobed, pale brown, smooth; seed ellipsoid, 3.5 mm long and 2 mm in diameter, grey. Flowers and fruits throughout the year.

Distribution and habitat

Native to South America; introduced and naturalized throughout the tropics. Common in most parts of India as a weed

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on roadsides, in fallow fields and in other disturbed, open habitats.

Medicinal properties and uses

The latex exuded from the shoots and leaves is reportedly used as an external application to promote healing of cuts and wounds. A decoction prepared from the juice of the crushed stem, leaves and inflorescence is given orally with sugar to relieve cough, nasal and chest congestion, and headaches associated with congestion among the Baigas of northeastern Madhya Pradesh; inhaling the vapours of the plant in boiling water reportedly cures breathing troubles.

References

Asolkar *et al.* (1992), Chopra *et al.* (1969), Verma *et al.* (1995).

Croton roxburghii Balak.

Botanical synonym

Croton oblongifolius Roxb.

Common names

Bengali: baragach; ***Hindi***: chucka; ***Kannada***: bhutala bhairava; ***Konkani***: ghansurang; ***Malayalam***: koteputol; ***Marathi***: ganasura, gunsur; ***Oriya***: putuli; ***Sanskrit***: bhutamkusam, bhutankusa, putrashreni; ***Tamil***: milgunari, millakumari; ***Telegu***: bhutakabhairi, bhutankasamu, bhutankusam.

Description

A small to medium-sized tree, its young shoots, twigs and inflorescence clothed with minute, orbicular, silvery scales. Leaves alternate, crowded at the ends of twigs, elliptic-oblong, oblong-lanceolate or ovate, 12.5–25 cm long and 5.7–11.5 cm wide, acute at apex, narrowed at base, margins crenate-serrate, green on both surfaces; main nerves numerous, slender; petioles 2–3.2 cm long. Flowers pale yellowish-green, solitary or fascicled in the axils of minute bracts on long, erect racemes, the male flowers in the upper part, the females in the lower part. Male flowers: pedicels variable in length to 4 mm long; calyx more than 6 mm across, segments more than 2.5 mm long, ovate, obtuse; petals 3 mm long, elliptic-lanceolate, obtuse, woolly. Female flowers: pedicels short, stout; sepals more acute than in the male with densely ciliate margins; petals 2 mm long,

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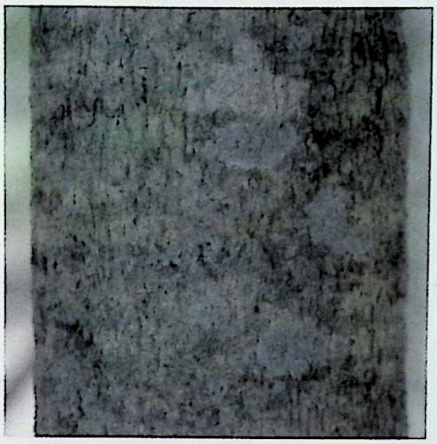
obovate, with densely woolly margins. Fruit a slightly 3-lobed capsule up to 1.3 cm in diameter covered with small orbicular scales; seeds ellipsoid, *c.* 8 mm long, rounded and smooth on the back.



Distribution and habitat

Found in northeastern India from eastern Uttar Pradesh (Oudh) to Assam, Bangladesh and Myanmar (Burma), Chota Nagpur (Bihar), Madhya Pradesh, and in dry or scrub forests in western and southern regions of peninsular India.

Medicinal properties and uses

The fruits, seeds and seed oil are considered purgative. In Goa and southern Konkan (Maharashtra) the bark is taken internally and applied locally to treat enlargement of the liver and in remittent fever. It is also used as an external application to relieve sprains, bruises and rheumatic swellings. The Santhalis use the stem bark and root as purgatives and as an alterative in treating dysentery; the powdered root is given to relieve stomach pain among the tribal inhabitants of eastern Bihar. The roots are used in combination with other ingredients in pills by the Mundas of Chota Nagpur to treat chronic rheumatism. Among the Paudi Bhuinya of northern Orissa, the juice expressed from the roots is taken by nursing mothers as an anthelmintic for their infants. The root bark is given in small doses as a purgative, although it is considered poisonous in large doses. A decoction of the root bark, with black pepper, is reportedly used to treat diarrhoea and dysentery, and to relieve inflammations and fevers. In Ayurveda, the roots, leaves and seeds are used as a substitute for those of *Baliospermum montanum* (*Euphorbiaceae*) for treating a variety of disorders.

References

Aminuddin and Girach (1996), Asolkar *et al.* (1992), Brahmam and Saxena (1990), Chopra *et al.* (1956), Jha and Varma (1996), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

Drypetes roxburghii (Wall.) Hurus.

Botanical synonyms

Drypetes timorensis (Blume) Pax & K. Hoffm., *Putranjiva roxburghii* Wall.

Common names

Bengali: jiaputa, putranjiva; ***Hindi***: jiaputa, juti, putijia, putranjiva; ***Kannada***: amani, menasinakale, putranjeevi, putrajiva; ***Malayalam***: pongalam, ponkolam; ***Marathi***: jewanputr, putajan; ***Oriya***: bholokoli, paishandia, pohunjonia, poitundia; ***Punjabi***: jiyaputra, putanjan; ***Sanskrit***: putranjiva, putranjivah; ***Tamil***: irukolli, karapula, karupalai, karupale; ***Telegu***: kadrajuvi, kuduru, kudurujivi, putrajivika.

Description

A small to medium-sized evergreen tree up to 18 m tall, with pale yellowish to greyish-white, corky bark; branches drooping, twigs minutely hairy. Leaves alternate, dark green, thinly coriaceous, shining, 5–10 cm long and 2.2–3.8 cm wide, elliptic-oblong to ovate-lanceolate, apex acute, base unequal-sided, margins serrulate, venation prominently reticulate beneath;

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petioles *c.* 0.6 cm long; stipules small, triangular, acute. Flowers small, dioecious: male flowers yellowish, in dense rounded axillary clusters, sepals 2.5 mm long, oblong, obtuse, ciliolate; female flowers green, axillary, solitary or 2–3 together, pedicels 8–13 mm long, sepals broadly elliptic, obtuse, concave, ciliolate, 2.5 mm long. Fruit ellipsoid or globose, pointed at the apex and narrowed at base, 1.3–2 cm long and 1.2–1.4 cm in diameter, white tomentose, pedicel 1.3–2.5 cm long; seed (stone) very hard, pointed, rugose, 0.5 cm in diameter. In central Indian deciduous forests, flowering occurs mainly in March and April; fruits mature 12 months later.

Distribution and habitat

Native to India, Bangladesh, Myanmar (Burma) and Sri Lanka, eastwards to Indochina, Thailand, peninsular Malaysia, Sumatra, Java, Borneo, Sulawesi, the Lesser Sunda Islands and the Moluccas. Found throughout tropical India to an altitude of about 750 m, usually on alluvial soils along rivers, in shaded valleys or in forested wetlands, and in evergreen to moist deciduous forests; often planted.

Medicinal properties and uses

The leaves, fruits and seeds are used in the form of a decoction to treat colds, fevers and rheumatism. In Ayurveda the plant is considered aphrodisiac, laxative and diuretic, and useful for treating erysipelas and elephantiasis; the leaves and seeds are used to relieve burning sensations, thirst, constipation, filariasis, and as an abortifacient.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

Euphorbia antiquorum L.

Common names

Bengali: bajwaran, lariyadaona, narasij, shibgach, tekatasij, tikta sij; ***Gujarati***: tandharisend; ***Hindi***: tidhara-send, tridhara-sehund; ***Kannada***: bontegalli, chadara galli, chaturagalli, jadekalli, mulajemudu, mundugalli; ***Malayalam***: chadurakalli, kalli, katakkalli; ***Marathi***: naraseja, narasya, narsej; ***Oriya***: dokahanasiju, lohasiju; ***Sanskrit***: vajrakantaka, snuhi, vajri; ***Tamil***: sadurakkalli, vachiram; ***Telegu***: bommajemudu, bontakalli, peddajemudu, sinhundumu; ***Urdu***: zakum.

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Description

A fleshy shrub or a small tree up to 9 m tall, with a cylindrical or fluted trunk and thick, rough, brown bark; branches fleshy, 3–5-angled, ascending, jointed with 3–4 thick wings, thorny. Leaves very small, 0.6–1.3 cm long, obovate-oblong, rounded, sessile, soon deciduous, with short, sharp, paired stipular spines. Flowers (involucres) borne 3 together in short-stalked cymes, the central flower sessile, female, the 2 lateral on stout pedicels; bracteoles numerous, glands 5, fleshy, pale yellow, rotately spreading around involucre. Fruits (capsules) 0.8–1.3 cm in diameter, bluntly angled, pale brown or reddish when mature; seeds 2.5–3 mm in diameter, globose-ovoid, smooth, white, glabrous.

Distribution and habitat

Native to the Indo-Malesia region, it is found in drier habitats throughout tropical and subtropical India to an altitude of about 600 m in the hills. Often grown as a hedge plant.

Medicinal properties and uses

The plant is considered to be purgative, digestive, pungent and bitter. A decoction of the stem is used to treat gout. The juice which flows from the cut branches is used as an irritant for treating rheumatism and toothache, and is a popular application for warts, sores, and other skin affections, and as an eardrop to relieve earache; it is also used to treat nervine diseases, palsy, dropsy and deafness. When taken internally, it acts as a drastic purgative. The root bark is also used as a purgative. In Unani medicine, the plant is used as a substitute for *Euphorbia tirucalli*.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

Euphorbia heyneana Spreng.

Botanical synonym

Euphorbia microphylla Heyne ex Roth

Common names

Bengali: chotokeruee; ***Gujarati***: dudhi; ***Marathi***: dudhi; ***Sanskrit***: dugdhika.

Description

An annual, prostrate herb with numerous dichotomously branched, whitish stems 10–25 cm long spreading from the root; internodes ribbed. Leaves opposite above, alternate below, 4–8 mm long, elliptic-oblong, with entire or serrulate, often pink, margins; stipules bipartite or toothed. Flowers (involucres) numerous, axillary, broadly campanulate, reddish, 1 mm long; stalk 0.6–1.2 mm long, lobes triangular, apiculate; gland very shortly stipitate with a small limb. Fruits (capsules) up to 1.5 cm in diameter, glabrous, keeled; seeds up to 1.2 mm long, quadrangular, yellowish-brown, smooth. Flowers and fruits from April to September.

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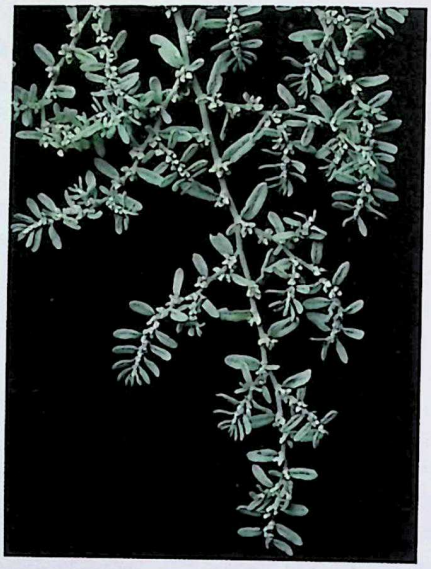
Distribution and habitat

Native to the Indo-Malesian region, it is frequently found along roadsides and in open fallow fields in Bangladesh and West Bengal, Bihar and the western regions of peninsular India.



Medicinal properties and uses

In Chota Nagpur (Bihar) a preparation of this plant along with that of *Cryptolepis buchanani* (*Asclepiadaceae*) is given to nursing mothers as a galactagogue.

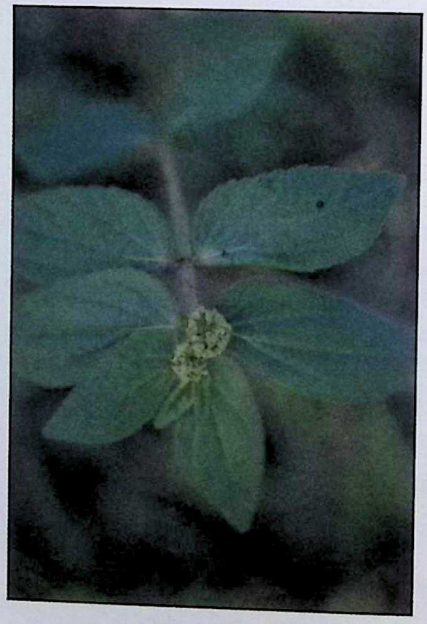
References

Chopra *et al.* (1956), Kirtikar *et al.* (1935).

Euphorbia hirta L.

Botanical synonyms

Chamaesyce hirta (L.) Millsp., *Euphorbia pilulifera* L.



Common names

Bengali: barokheruie, burakeru, burokeruree; ***English***: asthma herb, Australian asthma herb, pill-bearing spurge, snakeweed; ***Gujarati***: dudeli, dudheli, dudhi; ***Hindi***: dudhi; ***Kannada***: achchegida, karihalsoppu, kempu neneakkee soppu, taddina gida; ***Konkani***: dudurly; ***Malayalam***: nelapalai, nilappala; ***Marathi***: dudali, dudhi, dudnali, govardhan, mothidudhi, nayeti; ***Oriya***: khirsag; ***Sanskrit***: dugdhika, pusitoa; ***Tamil***: amumpatchaiyarissi, patchaiyarissi; ***Telegu***: bidarie, nanabala, nanabiyan, reddinanabrolu.

Description

An erect or procumbent annual herb 15–50 cm high; young stems densely clothed with yellow hairs; branches often 4-angled. Leaves opposite, 1.3–3.8 cm long and 0.6–1.6 cm wide, obliquely elliptic, apex acute, base usually unequal-sided, margins serrulate or dentate, hairy, dark green above and pale beneath; main nerves few, distinct; petioles distinct, 1.5–3 mm long. Flowers (involucres) numerous, less than 1.3 mm long, crowded in small, globose, greenish-yellow axillary cymes; gland minute, globose. Fruits (capsules) minute, *c.* 1.25 mm in diameter, trigonous, appressed hairy; seeds angular, 0.8 mm long, light reddish-brown. Flowers and fruits throughout the year.

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Distribution and habitat

A pantropical weed, common on roadsides and in open fields throughout tropical and subtropical India.

Medicinal properties and uses

The dried plant, collected with or without roots when it is in flower and fruit, comprises the drug known commercially as *Euphorbia*, or *Dugdhika* in Ayurveda. It is administered in the form of a liquid extract or tincture with lobelia (*Lobelia inflata*: *Lobeliaceae*) or senega (roots of *Polygala senega*: *Polygalaceae*) for treating coughs and asthma. The plant has a depressant action on the heart and a sedative effect on the mucous membrane of the respiratory and genito-urinary tracts. Its decoction is used for treating asthma and chronic bronchial affections. In the form of a tincture it is used for treating colic, dysentery, diseases of the genito-urinary tract, and as a vermifuge. The plant juice is used to treat dysentery and colic, and the latex is applied to destroy warts and to treat ringworm. A paste of the whole plant and salt is applied externally to promote the healing of boils among the Gonds of Uttar Pradesh and the tribal inhabitants of Udaipur District in Rajasthan. An extract of the crushed leaves is taken orally with honey to treat leucorrhoea among the tribal inhabitants of Orissa. The tribal inhabitants of southern Bihar apply the latex to the forehead to relieve headache. In northeastern Karnataka the roots, crushed with *jaggery* (unrefined brown sugar) and mixed with cumin seeds (*Cuminum cyminum*: *Apiaceae*), are taken to control excessive urination. The leaves are eaten as a vegetable.

References

Asolkar *et al.* (1992), Bhatt *et al.* (1999), Chopra *et al.* (1956), CSIR (1948–1992), Girach and Aminuddin (1995), Katewa and Arora (1997), Kirtikar *et al.* (1935), Sahoo and Mudgal (1995), Seetharam *et al.* (1999), Singh and Prakash (1994), Sivarajan and Balachandran (1994), Yoganarasimhan (1996).

Euphorbia neriifolia L.

Botanical synonym

Euphorbia ligularia Roxb.

Common names

Bengali: hijdaona, mansasij, patasij; ***Gujarati***: thor, tuaria; ***Hindi***: pattonkisend, sehund, thohar, thuar, thuhar; ***Kannada***: elagalli, yalekalli; ***Konkani***: nivalkantem, nivalkanti; ***Malayalam***: ilakkalli, kalli; ***Marathi***: mingut, nevagunda, neyadunga, niwarung; ***Oriya***: siju; ***Punjabi***: gangichu; ***Sanskrit***: sehunda, snuhi, snuk, vajra; ***Tamil***: ilaikkalli, kalli, manjevi, nadangi, naynakki; ***Telegu***: akujemuda; ***Urdu***: zakum.

Description

A large, succulent shrub or a small tree, usually 1.8–4.5 m tall with jointed

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branches bearing short, paired, stipular thorns in 5 vertical or slightly spiral lines. The plant closely resembles *Euphorbia nivulia*, but can be distinguished from it by the position of the thorns, which in *E. nerifolia* grow on warty knobs, whereas in *E. nivulia* they are borne on flat, corky patches. Leaves alternate, clustered at the ends of branches, deciduous, fleshy, 15–30 cm long, obovate or oblanceolate, base cuneate. Flowers (involucres) yellowish, 3–7 together in short-peduncled cymes; involucral lobes broadly cuneate. Fruit (capsule) deeply 3-lobed, approximately 1.3 cm in diameter. In central India, flowering occurs in February and March and fruiting from April to May; in this region the plant remains leafless between January–February and June.

Distribution and habitat

Common on rocky sites throughout western peninsular India and in Orissa; it is often cultivated as a hedge plant in villages throughout India, Pakistan and Sri Lanka.

Medicinal properties and uses

In Ayurveda the stem and the milky latex from the cut stem are used medicinally. The latex is considered expectorant, locally rubefacient, digestive and abortifacient; it is used to treat earache, enlargement of the spleen and liver, jaundice, leprosy, cutaneous affections, asthma, colic, dropsy, dyspepsia, flatulence, intermittent fever and rheumatism. It is applied externally to remove warts and to promote the healing of other skin eruptions. In Unani the plant is considered to have the same therapeutic properties as those of *Euphorbia tirucalli*. A decoction of the roots is reportedly taken internally as an abortifacient among the Bhils.

Warning

The latex is likely to cause dermatitis in most people.

References

CSIR (1948–1992), Joshi (1989), Kirtikar *et al.* (1935), Sivarajan and Balachandran (1994).

Euphorbia thymifolia L.

Botanical synonyms

Chamaesyce prostrata (Ait.) Small, *Euphorbia prostrata* Ait.

Common names

Bengali: dudiya, raktakeru, shweetkeruee, swetkerua; ***Gujarati***: nahanidudheli; ***Hindi***: chhotidudhi, chotadudhi, nigachuni; ***Konkani***: dudini; ***Marathi***: ghakdidudhi, lahandudhi, mothidudhi; ***Punjabi***: baradodak, dodhak, hazardana; ***Sanskrit***: dugdhika, ractavindachada; ***Tamil***: chinamampatchaiyausi, sittrapaladi; ***Telegu***: bidurunanabiyam, manubala, reddivari, reddivarimanubala.

Description

A small annual herb; stems prostrate, divaricately branched, slender, cylindrical,

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more or less hairy. Leaves opposite, very small, 3–6 mm long and 2.5–4 mm wide, obliquely oblong or elliptic-oblong, apex rounded, margins crenulate, base rounded and unequal-sided, glabrous above, glaucous and usually slightly pubescent beneath; petioles very short. Flowers (involucres) axillary, solitary or 2–3 together, campanulate, 0.8 mm long; stalk very short; gland minute or absent. Capsules 1.5 mm long, obtusely keeled, pubescent; seeds quadrangular, bluntly pointed, with 5–6 transverse furrows.

Distribution and habitat

Pantropical in distribution; found throughout India in the plains and lower hills, to an elevation of 1700 m in Kashmir.

Medicinal properties and uses

The dried leaves and seeds, both slightly aromatic, are considered stimulant, astringent, anthelmintic and laxative. In southern India they are given to children to relieve bowel complaints. The juice from the fresh plant is used in the Konkan to treat ringworm. Among the Mundas of Chota Nagpur, the pounded whole plant, mixed with sugar and water, is used to stop diarrhoea. The root is used by the Santhalis as a remedy for amenorrhoea. An essential oil distilled from the plant is used in medicinal soaps used to treat erysipelas and as a mosquito and fly repellent.

Reference

Asolkar *et al.* (1992), CSIR (1948–1992), Kirtikar *et al.* (1935).

Euphorbia tirucalli L.

Common names

Bengali: lankasij, latadaona; ***English***: Indian tree spurge, milk bush; ***Gujarati***: dandaliothora, pardeshithora, thordandalio; ***Hindi***: konpal, konpalsehnd, sehund, thuar, thohra; ***Kannada***: bontakalli, kodukalli, kolugalli, kolukalli; ***Malayalam***: guda, katerumakkalli, kolkalli, tirukalli; ***Marathi***: nirval, nivla, niwarang, shera, tej, vajraduju; ***Oriya***: lonkasiju; ***Sanskrit***: ganderi, trikantaka, vajradruma; ***Tamil***: kalli, tirukalli; ***Telegu***: chemudu, jemudu, kada jemudu; ***Urdu***: zakum.

Description

A large unarmed shrub or a small tree up to 5 m tall with erect branches; bark rough, cracked, greenish-brown, exuding a milky sap when cut; branchlets slender, smooth, cylindrical, polished, whorled. Leaves alternate, 7–15 mm long and 1–2 mm wide, sessile or subsessile, linear-spathulate, narrowing at base, apex obtuse, fleshy, appearing early in the rainy season and falling soon after; stipules minute, circular, black. Flowers (involucres) campanulate, clustered in heads at the ends or in the axils of

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branchlets. Fruit a 3-lobed capsule 0.5–0.8 cm in diameter, velvety, valves rounded, pale brown; seeds ovoid, smooth. Flowers and fruits from October to May in southern India; in central India, flowering occurs mainly in March and April.

Distribution and habitat

Native to tropical Africa; widespread throughout the Old World tropics, where it is widely cultivated as a hedge plant. In India it is planted extensively in villages and has become naturalized in many parts of the country, particularly in the drier regions of Bengal and in peninsular India.

Medicinal properties and uses

The latex exuded from the cut stem and branches is considered vesicant and rubifacient. It is used as an external application to remove warts and to relieve toothache, neuralgia and rheumatism. Taken internally, it acts as a purgative in small doses, but in large doses it is an acrid irritant and emetic. It is also used to treat coughs, asthma and earache. A decoction of the tender branches or the roots is given to treat colic and gastralgia. In Ayurveda the latex is considered alexiteric and carminative and is used to treat leprosy, leucorrhoea, abdominal problems and tumours. In Siddha, the latex is used to treat skin diseases, leprosy, glandular swellings and intestinal worms. In Unani medicine, the juice of the plant is considered useful for treating gonorrhoea, whooping cough, asthma, dropsy, leprosy, enlargement of the spleen, dyspepsia, jaundice, colic, tumours and bladder stones.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

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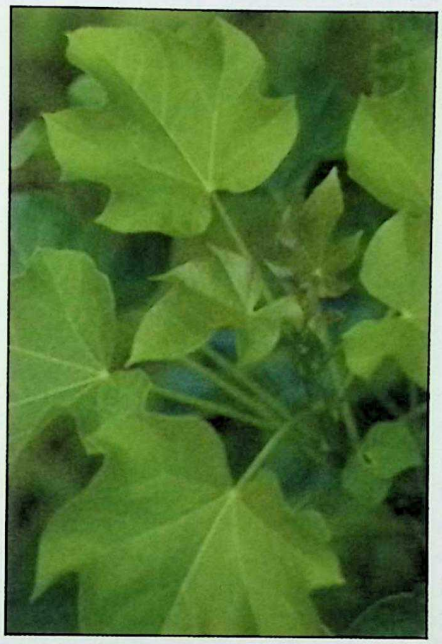
Jatropha curcas L.

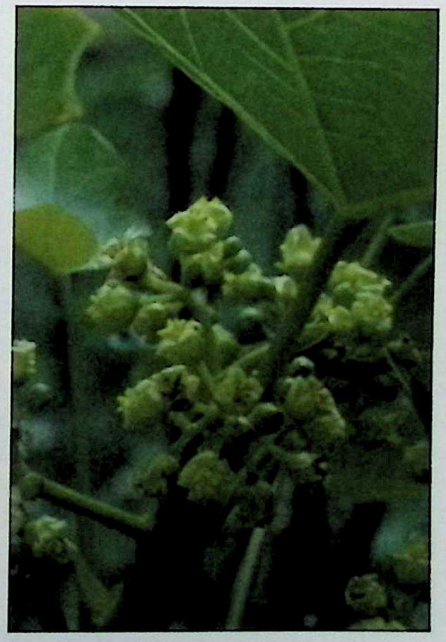
Common names

Bengali: bagbherenda, erandagachh; ***English***: curcas nut, physic-tree nut; ***Gujarati***: jamalgota, ratanjota; ***Hindi***: bagbherenda, chandarjot, jangliarand, rajanjot, safed arand; ***Kannada***: adaluharalu, bettada haralu, dodda haralu, karnocchi, maraharalu; ***Konkani***: erond, jemphal; ***Malayalam***: kadalavanakka, katalavanakku, kattavanakku; ***Marathi***: modali erandi, mogali erenda, ranayerandi; ***Oriya***: baigoba, jahanzigaba, norokokalo; ***Sanskrit***: dravanti, kananeranda, parvataranda; ***Tamil***: kadalamanakku, kaitta, kattamanakku, kuribaravuni, vellaiyamanakku; ***Telegu***: adaviamidamu, katiyamudamu, napalamu, nepalemu, peddanepalamu.



Description

A large soft-wooded shrub up to 6 m high with somewhat shiny, peeling bark and sticky, opalescent sap. Leaves alternate, 6–15 cm long and wide, broadly ovate, usually shallowly 3- or 5-lobed, glabrous, base cordate, 5–7-nerved, apex acute; petioles usually 10–15 cm long. Flowers about 0.7 cm across, yellowish-green in loose axillary cymose panicles 5–12 cm long; peduncles and pedicels more or less tomentose; bracts up to 1 cm long, linear. Male flowers: calyx 3.8 mm long, deeply 5-cleft, lobes elliptic, obtuse; corolla longer than the calyx, campanulate, lobes 5, yellowish, hairy within. Female flowers: calyx 5 mm long, lobes ovate, acute; corolla about as long as the calyx. Fruit (capsule) 2.5 cm long, ovoid, turning black when ripe and breaking into three 2-valved cocci; seeds ovoid-oblong, dull brownish-black, 1.8 cm long. In central India, flowering occurs mainly between July and September and fruiting from October to December; in this region, plants remain leafless between December–January and May–June.



Distribution and habitat

Native to tropical America from Mexico and the West Indies southwards to Chile.

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Introduced to Africa and India as an oil-yielding plant, probably by the Portuguese during the European colonial period. At present it is often grown as a hedge plant or field barrier in India and is frequently naturalized in the vicinity of villages in open, disturbed habitats, commonly in wastelands.

Medicinal properties and uses

In Ayurveda the fruit and the seed are considered astringent and anthelmintic and useful for treating chronic dysentery, urinary discharges, biliousness, anaemia, fistula and heart diseases. The leaves are considered rubefacient and lactagogue; the leaf juice is used as an external application to arrest bleeding from wounds, ulcers and cuts, and to relieve piles; it is also reported to have insecticidal properties. Among the Irular in Tamilnadu, the leaf juice is applied to the breasts of nursing mothers to increase lactation; they also use the stem as a toothbrush to strengthen gums. The tender twigs of the plant are also used for cleaning teeth, and the juice is reported to relieve toothache and strengthen gums. The latex of the plant is reportedly effective as an external application for treating scabies, eczema, ringworm and to promote healing of boils and foot sores; in southern Orissa, it is taken internally with ripe banana to treat dysentery in adults. The sap from the twigs is considered styptic and is used for dressing wounds and ulcers. The bark, rubbed with asafoetida and buttermilk, is reportedly taken internally in Konkan (Maharashtra) to relieve dyspepsia and diarrhoea. A decoction of the bark is used externally for treating rheumatism and leprosy. A decoction of the root bark is used to rinse the mouth to relieve toothache and sore throat among the tribal inhabitants of southern Andhra Pradesh. A paste of the root bark is used externally to promote the healing of sores, swellings and eczema.

Warning

Although the fruit, seeds and seed oil are reportedly used for medicinal purposes in India and elswhere, the seeds are a violent purgative and known to be poisonous.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Girach (1992), Jha and Varma (1996), Joshi (1989), Kirtikar *et al.* (1935), Mohanty *et al.* (1996), Ragupathy and Mahadevan (1991), Rao *et al.* (1996), Sivarajan and Balachandran (1994), Varma (1997), Yoganarasimhan (1996).

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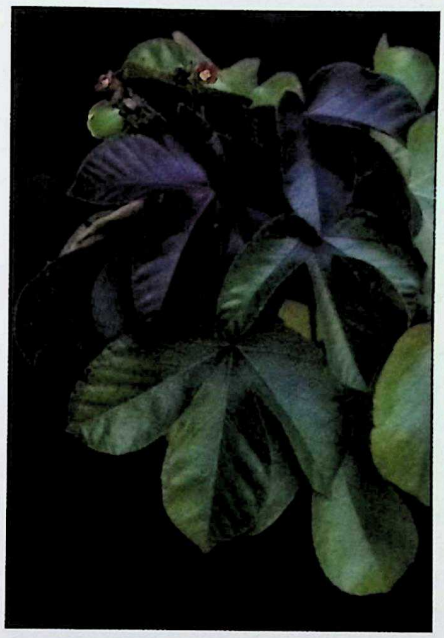
Jatropha gossypifolia L.

Common names

Bengali: lalbherenda; ***Gujarati***: nepalo, vilayati nepalo; ***Hindi***: bherenda, verenda; ***Kannada***: chikka kaadu haralu, chitletti, kariturukaharalu; ***Malayalam***: simaya-vanakku; ***Oriya***: rangakalo; ***Sanskrit***: dravanti; ***Tamil***: adalai, atalai, kattamanakku, simaiyamanakku; ***Telegu***: nela-amida, nepalemu, simanepalemu.



Description

A bushy, gregarious shrub up to 1.8 m high. Leaves up to 20 cm long and wide, palmately 3–5-lobed, lobes obovate, margins entire, apex shortly acuminate, base cordate, purplish-brown and shining when young, later turning green, leaf margins, petioles and stipules covered with sticky, yellow glandular hairs. Flowers small, dark red, crimson or purplish, borne in glandular, terminal corymbose cymes. Fruit (capsule) oblong, rugose, about 1 cm across, 3-lobed, truncate at both ends; seeds greyish-red. In central India, where flowering and fruiting occur from July to September, the plant usually remains leafless between February and April–May. In southern India flowering and fruiting occur from February through to July.

Distribution and habitat

Native to the American tropics from Central America and the West Indies southwards to Brazil; introduced as an ornamental in gardens throughout the Old World tropics. In India it is often naturalized as a common weed in open degraded habitats such as roadsides throughout most of the plains districts of India.

Medicinal properties and uses

A decoction of the bark is used as an emmenagogue, and that of the leaves is used as a purgative and stomachic to relieve stomach-ache. In southern Orissa an aqueous extract of the stem bark us given orally to treat diarrhoea. The latex from the cut stem and branches is applied to promote healing of ulcers. The leaves or leaf paste are applied to relieve boils, carbuncles, eczema, scabies and itches. The leaf juice is applied to sores on infants' tongues, and a cataplasm of the fresh leaves is used to relieve swollen breasts. In Ayurvedic practice, the root, leaves and fruit are used as a substitute for those of *Jatropha curcas*. The seed oil is used by the rural inhabitants of Bhavnagar District as an external application to treat ringworm, eczema, scabies and rheumatism.

Warning

The seeds act as a drastic purgative and emetic, reportedly cause insanity, and are as toxic as those of *Jatropha curcas*.

References

Asolkar *et al.* (1992), Bhatt and Mitaliya (1999), Bhatt *et al.* (1999), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935), Mohanty *et al.* (1996), Sivarajan and Balachandran (1994), Yoganarasimhan (1996).

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Jatropha multifida L.

Common names

English: coral plant, small physic nut; ***Kannada***: havalada mara, simeauvdala, vilayatiharalu; ***Marathi***: chiniyerandi; ***Sanskrit***: bhadradanti, guchhphala, vishabhadra; ***Tamil***: kattunervalam, malaiyamanakku.

Description

A large shrub or small tree up to 3 m tall. Leaves long-petioled, orbicular, 7.5–12.5 cm wide, palmately divided into 5–11 lobes; lobes lanceolate-acute or elliptic-acute. Flowers coral red, borne on many-flowered, long-pedunculate, flat-topped terminal cymes. Fruit (capsule) 3-lobed, about 2.5 cm long, obovate, smooth, yellowish when ripe.

Distribution and habitat

Native to tropical South America and widely cultivated in gardens for its ornamental foliage and flowers throughout the tropics. In India it is occasionally naturalized.

Medicinal properties and uses

In Ayurveda, the fruit is considered pungent, heating and purgative; it is reportedly used as an external application to treat enlarged spleen, piles, wounds and skin diseases. In Indochina a decoction of the dried roots is given to relieve indigestion and colic, and as a tonic. The leaves are used to treat scabies and as a purgative. The latex of the plant is applied to promote healing of wounds and ulcers.

Warning

Although the fruit and seeds are reportedly used for medicinal purposes in India and elsewhere, both are poisonous, particularly to children, and cause vomiting and intense burning pain in the stomach; if ingested, lime juice and stimulants are administered as antidotes.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

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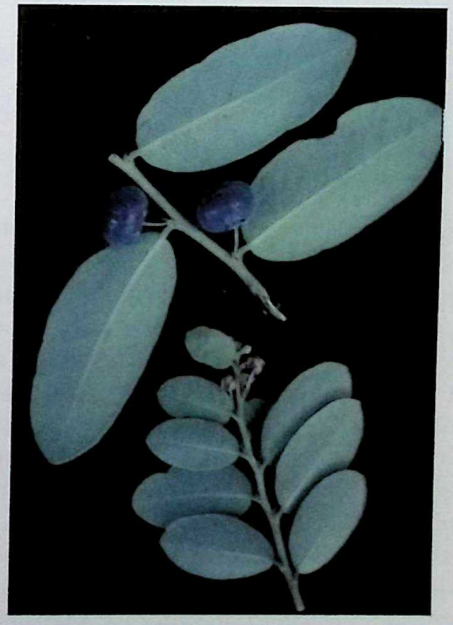
Kirganelia reticulata (Poir.) Baill.

Botanical synonyms

Anisonema multiflora Wight, *Phyllanthus multiflorus* Willd, *P. reticulatus* Poir.

Common names

Bengali: panjuli; ***Gujarati***: datwan, kamboi; ***Hindi***: buinowla, makhi, panjoli, panjuli; ***Kannada***: anamsule, chippulinellu, huli, karesuli, karihuli, krishnanelli, sannahagesoppu; ***Konkani***: kaili; ***Malayalam***: kattuniruri, kilanelli, nirnelli, niruri; ***Marathi***: pavan, pavana; ***Oriya***: bonotihudi, jandaki, jojangi, phajoli; ***Punjabi***: panjuli; ***Sanskrit***: krishna-kamboji; ***Tamil***: abiranji, karunelli, karuppupilanji, nirppulanji, pula, pullanti; ***Telegu***: nallapuli, nallapuruguda, nellapurududu, pandicarranlue, phulsar, pulicheru, pulisar.



Description

A large, straggling or climbing shrub up to 4.5 m tall with smooth or lenticellate branches. Leaves alternate, elliptic-oblong or obovate, up to 3.2 cm long and 1.8 cm wide, acute or rounded at both ends, lower surface pale green; petioles up to 0.3 cm long; stipules minute, ovate, acute. Flowers reddish, unisexual, axillary; male flowers 2–6 together in fascicles, female solitary. Fruit (capsule) fleshy, subglobose, 0.5 cm in diameter, purplish-black when ripe, containing 8–16 irregularly trigonous seeds. Flowers and fruits throughout most of the year depending on locale; usually leafless between January and February.

Distribution and habitat

Common in low-lying moist habitats in thickets and hedges along rivers, irrigation channels and wastelands throughout most of tropical India to an altitude of 1800 m in Meghalaya. Also found in Pakistan, Sri Lanka, tropical Africa, China and Malaysia.

Medicinal properties and uses

The leaves are considered diuretic and cooling. They are used externally in the form of a paste to relieve headache among the Kondhs of southwestern Orissa, and as

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a powder to promote healing of ulcers and boils among the Mundas in southern Bihar. Their juice is used to relieve diarrhoea in infants and, made into a pill with camphor and cubebs (*Piper cubeba*: *Piperaceae*), to treat bleeding gums. The juice from the stems is applied to the teeth to relieve severe toothache and infected gums among the tribal inhabitants of southern Andhra Pradesh; in Bhavnagar District, Gujarat, the twigs are used as toothbrushes. The fruit is astringent to the bowels and reportedly useful for treating diseases of the blood, as a purgative, and for treating syphilitic sores. A decoction of the root is given to children to treat asthma, coughs and catarrh. The bark has a faintly sweet taste and is considered alterative, attenuant, astringent and diuretic; it is reportedly used to treat rheumatism, dysentery and venereal diseases. An infusion of the bark is taken internally to relieve swellings among the tribal inhabitants of western Maharashtra.

References

Asolkar *et al.* (1992), Bhatt and Mitaliya (1999), Chopra *et al.* (1969), CSIR (1948–1992), Girach (1992), Kirtikar *et al.* (1935), Rao *et al.* (1996), Upadhye *et al.* (1994), Varma (1997), Yoganarasimhan (1996).

Macaranga indica Wight

Botanical synonym

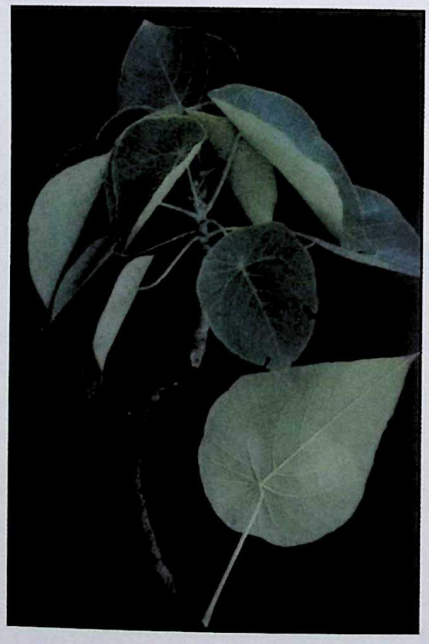
Macaranga flexuosa Wight

Common names

Kannada: bettadavare; ***Malayalam***: puthatamara; ***Tamil***: vattathamarei, vuttuttamara.

Description

A small or medium-sized evergreen tree up to 20 m tall with smooth grey bark and stout branchlets marked with leaf scars; young parts clothed with rusty deciduous tomentum. Leaves 12–25 cm long and 8–14 cm wide, orbicular-ovate, broadly peltate, apex acute or cuspidate-acuminate, base rounded, margins entire or minutely toothed, upper surface brown pubescent when young, pubescent and thickly covered with minute dark red glands beneath; petioles 7.5–15 cm long; stipules ovate, acuminate, reflexed, deciduous. Male inflorescence up to 12 cm long, much-branched, densely pubescent; male flowers minute, 0.4 mm in diameter, sessile, fascicled at intervals along axis; female inflorescence longer and denser than male, female flowers stalked. Fruit (capsule) very small, less than 0.6 cm, comprising 2 globose, glandular cocci. Flowers and fruits from October to December in southwestern India.



Distribution and habitat

Native to India southwards and eastwards through Bangladesh, Myanmar (Burma), Sri Lanka, Indochina, Thailand and peninsular Malaysia. In India it is found in moist sec-

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ondary deciduous forests in the outer Himalayas from Kumaon (northern Uttar Pradesh) eastwards at altitudes of 900–1500 m, to West Bengal, Bihar, and the northeastern States, as well as in the Western Ghats.

Medicinal properties and uses

The gum exuded from the cut branches, petiole bases, young shoots and fruits is used as an external application to relieve venereal sores.

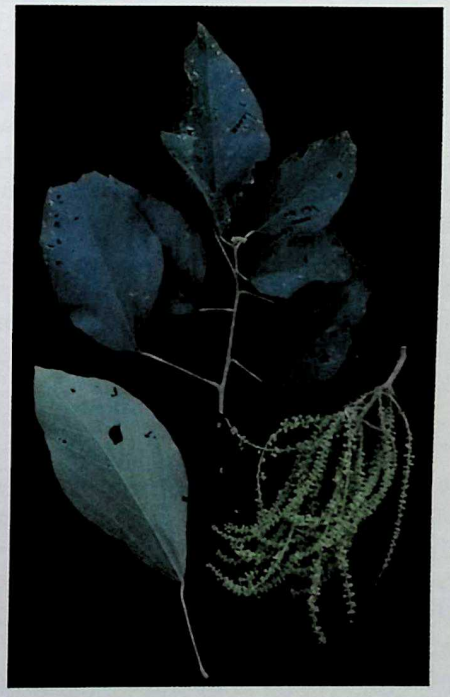
References

Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935).

Mallotus philippensis (Lam.) Muell. Arg.

Botanical synonyms

Croton philippense Lam., *Mallotus reticulatus* Dunn, *Rottlera tinctoria* Roxb.



Common names

Bengali: kamala, kamalagundi, kamila, tung; ***English***: kamala tree, monkey face tree; ***Gujarati***: kapilo; ***Hindi***: kamala, kamila, raini, rauni, rohini, rori, sindur; ***Kannada***: chandrahittu, ettunalige, kapila, kesarimavu, kunkuma, munnaga; ***Malayalam***: chenkolli, kapila, kampippala, kuramatakku, manjana, tavitu; ***Marathi***: kuku, shendri, shindur; ***Oriya***: bosontogundi, kapilogundi, kunkumo, punango, sinduri; ***Punjabi***: kamal, kamela, rulya; ***Sanskrit***: kampilla, kampillaka, kampillakah, rechanaka; ***Tamil***: kamala, kapila, kapli, kungumam, kuranguman-janatti; ***Telegu***: chendiramu, kumkuma, kunkuma, sinduri; ***Urdu***: kalileh.

Description

A shrub or a small, much-branched, evergreen tree up to 10 m tall with a short, often buttressed, trunk, and thin, grey bark; twigs, young leaves and inflorescences tawny- or rusty-tomentose. Leaves alternate or subopposite, variable, 8–16 cm long and 1.5–7.5 cm wide, usually ovate-elliptic or ovate-lanceolate, apex acute to acuminate, base rounded, margins entire or slightly toothed, glabrous above, glaucous pubescent and with numerous red glands beneath; venation reticulate, strongly 3-nerved at the base and 4–7 pairs of nerves above the basal ones; petiole 1.5–9 cm long, with 2 small glands on each side of the

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apex. Flowers small, dioecious, greenish-yellow, borne in simple or branched terminal paniculate spikes; pedicels very short or absent. Male flowers: sepals 4, 3 mm long, lanceolate; bracts 1.5 mm long, broadly ovate. Female flowers: calyx divided nearly to the base, sepals 3–4, thicker than in the male, ovate-lanceolate. Fruit (capsule) globose, 3-lobed, 3-valved, 0.8–1 cm long and 0.6 cm in diameter, densely covered with reddish-brown glandular pubescence; seeds subglobose, black, smooth, 0.4–0.5 cm in diameter. Flowers from August to December and fruits between November and March in peninsular India.

Distribution and habitat

Widely distributed from northern India to Sri Lanka and eastwards throughout Southeast Asia to Taiwan, Malesia, northern Australia and the Pacific islands. In India it is found throughout the country except in the driest regions, up to 1500 m elevation in the Himalayas and the Western Ghats. It is a pioneer species characteristic of secondary vegetation, commonly found, often gregariously, in moist habitats such as streambanks in sal (*Shorea robusta*)-dominated forests, and in mixed deciduous and dry, open, thorn forests and abandoned agricultural fields.

Medicinal properties and uses

The dried, powdered, red pubescence surrounding the ripe fruits, known commercially as *Kamala*, or *Kampillakah* in Ayurveda, is used medicinally as a styptic and anthelmintic. Taken with milk or curd (yoghurt), it is a reputed remedy for expelling tapeworms. It is also used as an oral contraceptive, its principal anti-fertility factor identified as rottlerin. *Kamala* powder as well as other parts of the plant is also used in external applications to promote the healing of ulcers and wounds, and to treat parasitic affections of the skin such as scabies, ringworm and herpes. A decoction of the stem bark, along with that of *Mangifera indica* (*Anacardiaceae*), the whole plant of *Cuscuta reflexa* (*Convolvulaceae*) and the leaves of *Dendrocalamus strictus* (*Poaceae*), is used as a bath for treating jaundice among the Gonds of Uttar Pradesh. A decoction of the flowers is used as an anthelmintic among the tribal inhabitants of Sundargahr District in Orissa. *Kamala* powder was widely used in the past for dyeing silk and wool a bright orange or flame colour.

References

Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935), Mukherjee and Namhata (1990), Singh and Prakash (1994, 1998), Sivarajan and Balachandran (1994).

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Phyllanthus emblica L.

Botanical synonyms

Cicca emblica Kurz, *Emblica officinalis* Gaertn.

Common names

Bengali: ambolati, amla, amlaki; ***English***: emblic myrobalan, Indian gooseberry; ***Gujarati***: amali, ambala, bhoza; ***Hindi***: amla, amlika, aonla, aunra; ***Kannada***: amalaka, chattu, dadi, dhanya, nelli, sudhe; ***Konkani***: anvallo, dogranvalli, dogranvallo; ***Malayalam***: amalakam, nelli, nellikka; ***Marathi***: anvala, aonla, aonli, awla, bhuiawali; ***Oriya***: anla, khondona, onola, ounla, oura; ***Punjabi***: ambal, amla, amli, aonla; ***Sanskrit***: adiphala, amalaki, dhatri; ***Tamil***: amalagam, indul, kattunelli, nelli, perunelli, tattiri; ***Telegu***: amalakamu, nelli, triphalamu, usirikai, usiriki; ***Urdu***: anwala.

Description

A small or medium-sized, deciduous tree with a crooked trunk and spreading branches; bark smooth, greenish-grey, peeling off in flakes; young branchlets reddish-brown, hairy. Leaves small, subsessile, closely set along branchlets, narrowly linear, 10–13 mm long and *c.* 3 mm wide, apex obtuse; stipules ovate, finely acute. Flowers greenish-yellow, minute, unisexual, borne in dense axillary fascicles along the branchlets. Male flowers numerous on short slender pedicels; sepals 6, oblong, obtuse, 1.2 mm long. Female flowers few, subsessile; sepals as in the male flowers. Fruit globose, fleshy, 1.5–3 cm in diameter, shining yellowish-green (sometimes reddish) when ripe, obscurely 6-lobed, containing 6 trigonous seeds. Flowers during the hot season (March–June) and fruits ripen during the following winter (November–March) in most parts of India; a second flowering period in February is sometimes observed in southern India.

Distribution and habitat

Native to India and Sri Lanka eastwards to southern China, Malaysia and Indonesia. Found in mixed and dry deciduous forests throughout tropical and subtropical India to an altitude of 1200 m; extensively planted in home gardens throughout the country.

Medicinal properties and uses

The fruit, commonly known as *amla* or *emblic myrobalan*, is highly valued in tradi-

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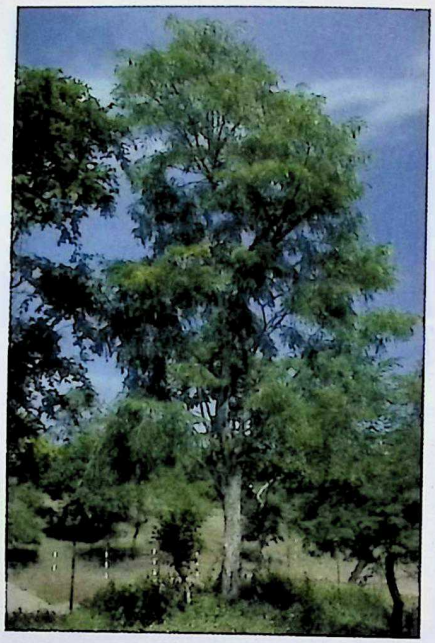
tional Indian medicine. It is considered acrid, cooling, astringent, diuretic and laxative. It is one of the richest known natural sources of vitamin C, its juice containing almost 20 times as much vitamin C as orange juice. In Ayurveda the fruits are considered cooling, alexiteric, carminative, alterative, laxative, tonic and antipyretic; they are used to treat vomiting, biliousness, urinary discharges, leprosy, constipation, inflammations, erysipelas, piles, anaemia, strangury, anuria and ophthalmia. *Triphala*, an Ayurvedic drug consisting of equal parts of the dried powdered fruits and those of *chebulic myrobalan* (*Terminalia chebula*: *Combretaceae*) and *belleric myrobalan* (*Terminalia bellerica*), is used as a remedy for headache, biliousness, dyspepsia, constipation, piles, enlarged liver and ascites. In Unani the fruits are reportedly used to treat diseases of the heart and liver, piles, biliousness and eye troubles. The raw fruits are eaten as an aperient. In southern West Bengal, balls made from the fruit juice and rice powder are used to relieve constipation. The dried fruits are used to treat haemorrhage, diarrhoea and dysentery. In combination with iron it is used as a remedy for anaemia, jaundice and dyspepsia. A fermented liquor prepared from the fruit is used for treating jaundice, dyspepsia and cough. A sherbet made of the fruits and lemon juice reportedly arrests acute bacillary dysentery. Among the Kondhs of southwestern Orissa, the fruit juice mixed with the powdered root of *Cissampelos pareira* (*Menispermaceae*) is taken internally as a cure for dysentery. The exudation from incisions in the fruit are used as an external application for eye inflammation. The seeds are reportedly used in the treatment of asthma, bronchitis and biliousness. Tribal inhabitants of central Orissa reportedly take the dried, powdered seeds in the treatment of leucorrhoea. The flowers are regarded as cooling and aperient. The leaves are used to



treat ophthalmia and incipient blindness; in Gujarat, they are used in the form of an infusion with fenugreek seeds to treat chronic dysentery. Among the Sahariyas of northwestern Madhya Pradesh, an infusion of the leaves is given with common salt to relieve constipation. The root and bark are astringent. In the Konkan (Maharashtra) the juice of the fresh bark, mixed with honey and turmeric, is used to treat gonorrhoea. Among the Gonds of Uttar Pradesh, the juice of the young stem is used as an eardrop for checking pus formation and earache.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Ghosh and Sensarma (1997), Girach (1992), Kirtikar *et al.* (1935), Sahoo and Mudgal (1995), Sikarwar and Kaushik (1992), Singh and Prakash (1994), Sivarajan and Balachandran (1994), Yoganarasimhan (1996).

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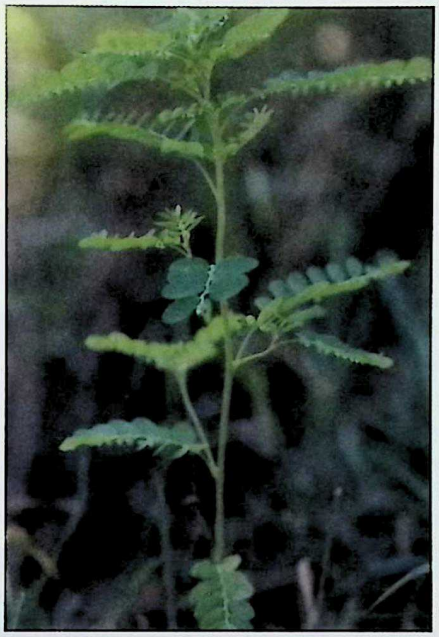
Phyllanthus fraternus Webster



Botanical synonym

Phyllanthus niruri sensu Hook. f.

Common names

Bengali: bhuiamla, sadahazurmani; ***Gujarati***: bhonya-ambli, bhonya-amli, bhonya anmali; ***Hindi***: bhonyabali, bhuinanvalah, jangli amli, jaramla; ***Kannada***: kiranelligida, nelanelli; ***Malayalam***: kirganelli, kizhanelli, kizhkkayinelli; ***Marathi***: bhuivali; ***Oriya***: badianla, bhuiaola, bhuin aonla; ***Sanskrit***: bahupatri, bhumyamalaki, tamalaki; ***Tamil***: kilanelli, kilkkaynelli; ***Telegu***: nelausirika, nelavusari; ***Urdu***: buiamla.

Description

An erect herb up to 60 cm tall with angular stems. Leaves elliptic-oblong or linear-oblong, apex obtuse, base rounded or subcordate, to 1 cm long and 0.5 cm wide, pale beneath; stipules lanceolate, basally attached. Flowers axillary, yellowish, greenish or almost white; male flowers borne 1–3 together, female solitary. Fruit (capsule) depressed-globose, smooth, scarcely lobed; seeds trigonous, pale brown, longitudinally ribbed. Flowers and fruits from November to July in southern India.

Distribution and habitat

A pantropical weed, probably native to Pakistan and western India, it is found as a common winter weed of cultivated fields, along roadsides, and in other open, disturbed habitats throughout tropical and subtropical India.

Medicinal properties and uses

The herb is bitter in taste and considered to have astringent, deobstruent, stomachic, carminative, diuretic, febrifugal and antiseptic properties. In Ayurveda it is considered to be one of the sources of the drug *Tamalaki*, a reputed remedy for jaundice. It is used to treat gastrointestinal ailments such as dyspepsia, colic, diarrhoea and dysentery, and also for dropsy and diseases of the urinogenital system. The whole, pounded plant is used as a poultice for ulcers, sores, swellings and skin affections. The plant juice or a decoction of the whole plant is used as a prophylaxis against malaria, cold and jaundice by the rural inhabitants of Bhavnagar District in

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Gujarat. Among the tribal inhabitants of north central Uttar Pradesh, its decoction with that of *Eclipta alba* (*Asteraceae*) and the leaves of *Ricinus communis* (*Euphorbiaceae*) is also given to treat jaundice and other liver diseases. The Kondhs of southwestern Orissa use pills prepared from the dried, powdered fruits, mixed with the fruit and root of *Holarrhena antidysenterica* (*Apocynaceae*) and leaves of *Andrographis paniculata* (*Acanthaceae*) to cure insomnia. The fresh roots are reportedly useful for treating jaundice, and are taken with milk as a galactagogue. In southern Orissa the root paste is given to children under 2 years of age to treat diarrhoea. A decoction of the leaves is used to cool the scalp. The leaves and roots are made into a poultice with rice water and applied to relieve oedematous swellings and ulcers. The latex from the plant is applied to promote healing of sores and ulcers, and mixed with oil it is used to treat ophthalmia. A decoction of the stem and leaves can be used to dye cotton black and as an ink substitute.

References

Bhatt and Mitaliya (1999), Bhatt *et al.* (1999), Chopra *et al.* (1956), CSIR (1948–1992), Girach (1992), Kirtikar *et al.* (1935), Mohanty *et al.* (1996), Singh and Prakash (1998), Sivarajan and Balachandran (1994).

Phyllanthus maderaspatensis L.

Common names

Gujarati: kanochha, ranavali; ***Hindi***: hazarmani, kanocha, kanochha, ranavali; ***Kannada***: madarasa nelli; ***Sanskrit***: bhumyamalaki; ***Tamil***: mela nelli; ***Telegu***: nallausereki, nallausirike; ***Urdu***: kanodcha.

Description

An erect or decumbent annual or perennial herb with a woody base; stems 30–90 cm long. Leaves variable, scattered or spirally arranged, 0.6–3.2 cm long and 0.3–1.6 cm wide, linear to oblanceolate, apex obtuse or apiculate, base cuneate, lateral veins 4–8 pairs; petioles very short (1 mm long); stipules peltate, lanceolate, acuminate. Flowers minute, greenish, axillary: male flowers borne in small clusters, subsessile; female flowers solitary, shortly pedicellate; sepals 6, obovate, obtuse, green with white margins. Fruits (capsules) smooth, depressed-globose, 3 mm in diameter, 3-lobed or shallowly 6-lobed; seeds trigonous, 1.5 mm long, rounded on the back, with fine, dark brown lines forming a basketwork pattern. Flowers and fruits throughout the year.

Distribution and habitat

Found throughout the Old World tropics from tropical Africa to Australia. It is common in open fields throughout the drier parts of tropical and subtropical India; in southern India, it is particularly common in coastal regions on beaches and dunes and inland on black cotton soils.

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Medicinal properties and uses

In Unani medicine the leaves are considered expectorant and diaphoretic. An infusion of the leaves is used to relieve headache. The seeds reportedly possess laxative, carminative and diuretic properties; they are used in Unani medicine for treating bronchitis, earache, griping, ophthalmia and ascites.

References

Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

Phyllanthus urinaria L.

Botanical synonym

Phyllanthus leprocarpus Wight

Common names

Bengali: hazarmani; ***Gujarati***: kharsadabonyaanmali, kharsadabonyaansari; ***Hindi***: hazarmani, lalbhuinanvalah; ***Kannada***: kempukiranelli, kempu nela nelli; ***Malayalam***: chirukizhukanelli, chukannakizhanelli, chuvannakizhanelli; ***Marathi***: lalmundajanvali; ***Oriya***: bhuinanla; ***Sanskrit***: bahupatra, bahuphala, tamlaki; ***Tamil***: shivappukeelanelli, shivappunelli; ***Telegu***: errauririka, ettausirika.

Description

A diffusely branched, erect, annual or sometimes perennial herb 30–60 cm tall; leaf-bearing branchlets short, flattened or slightly winged. Leaves distichous, closely placed, oblong-elliptic or linear-oblong, 6–13 mm long and 2.5–6 mm wide (leaves on main stems reduced to scales), apex apiculate, base rounded, pale beneath; stipules peltate, very acute, from a broad base. Flowers minute, axillary, yellowish-white;

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male flowers pedicelled and fascicled, female solitary and sessile; sepals 0.8–1 mm long, oblong, rounded, not enlarged in fruit. Fruits (capsules) globose, 3 mm in diameter, scarcely lobed, echinate; seeds 1.5 mm long, trigonous, rounded on the back, transversely furrowed. Flowers and fruits from May to September in Karnataka.

Distribution and habitat

Native to tropical Asia and introduced into Africa and tropical America. In India it is commonly found as a weed in cultivated areas and among grasses in open forest habitats, generally in moister areas, throughout the country to an altitude of 900 m.

Medicinal properties and uses

The plant is used medicinally in the same way as *Phyllanthus fraternus*. It is considered to be an excellent diuretic for treating dropsy, and for gonorrhoea and other genito-urinary problems. The juice of the leaves is given in coconut milk to children as an appetizer. Among the tribal inhabitants of eastern Bihar, the leaf extract is given to relieve coughs; a decoction of the leaves is used as a dressing for sores and swellings. In Chota Nagpur (Bihar) the root is given to sleepless children. In Ayurveda the whole plant is reportedly used to relieve thirst and to treat bronchitis, asthma, leprosy, anaemia, jaundice, urinary discharges, anuria, eye diseases and biliousness.

References

Chopra *et al.* (1956), CSIR (1948–1992), Jha and Varma (1996), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

Phyllanthus virgatus Forst. f.

Botanical synonyms

Macraea oblongifolia Wight, *Phyllanthus simplex* Retz., *P. simplex* var. *oblongifolius* (Wight) Muell. Arg.

Common names

Gujarati: motibhonyaanmali; ***Marathi***: bhujavali, motibhuiavali; ***Tamil***: ushchiusirika; ***Telegu***: uchchiyusirika.

Description

An erect or procumbent, annual or perennial woody herb usually up to 20 cm tall. Leaves distichous, closely placed and often overlapping on branchlets, linear-oblong to obovate, 5–20 mm long and 3–6 mm wide, apex apiculate, base rounded, glaucous beneath; stipules peltate, reddish-brown. Flowers minute, axillary; male flowers brownish-purple, usually 2–3 together, sessile; female flowers white, solitary on slender pedicels, usually larger than the male; sepals *c.* 0.8 mm long, oblong, obtuse, those of the female flowers slightly enlarged in fruit. Fruits (capsules) depressed-globose, slightly 3-lobed, 2.5 mm in diameter, smooth to slightly rough, long-stalked, dark brown; seeds 1.2–1.5 mm long, trigonous, rounded on the back, with red tubercles. Flowers and fruits from June to December in Karnataka.

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Distribution and habitat

Occurs naturally in tropical Asia from the Indian subcontinent to the Pacific islands. In India it is common along roadsides, in open fields and dry deciduous forests in the plains and low hills throughout the country.

Medicinal properties and uses

The plant is credited with antiseptic properties, and the bruised fresh leaves, mixed with buttermilk, are used as a wash to relieve itching. The fresh leaves, flowers and fruits are made into an electuary with cumin seed and sugar to treat gonorrhoea. A preparation of the root is applied to promote healing of mammary abscesses. In Ayurveda, the whole plant is used as a substitute for *Phyllanthus urinaria*.

References

Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

Ricinus communis L.

Common names

Bengali: bheranda, bherenda; ***English***: castor oil plant, castorseed, palma christi; ***Gujarati***: diveli, diveligo, tirki; ***Hindi***: arand, erandi; ***Kannada***: avadulu, chittuharalu, eranda, haralu, manda, oudala, vardhamana; ***Konkani***: erendi; ***Malayalam***: amandam, avanakku, chittavanaku, erandam, gandharvahastakam, kotta; ***Marathi***: erandi, irandi, yarandicha; ***Oriya***: bheronta, chitroko, erondo, gobo, joda, kalo, monto; ***Punjabi***: aneru, arand, bedanjir, harnauli; ***Sanskrit***: erand, eranda, vatari; ***Tamil***: amanakku, erandam, kothai, kottaimuthu, peramanakku, sittamanakku; ***Telegu***: amudamu, chittamudamu, erandamu, peramudamu; ***Urdu***: eranda.

Description

An annual or perennial bush or a small, soft-wooded tree up to 6 m tall. Leaves alternate, green or reddish, 30–60 cm wide, palmately 5–11-lobed, lobes serrate and petioles with conspicuous glands at the tip. Flowers monoecious, borne in spikes; male flowers on the lower and female flowers on the upper part of the axis. Fruit (capsule) usually covered with soft spines, dehiscing into three 2-valved cocci; seeds oblong, variable in size, smooth, variously coloured, mottled. The species includes a number of varieties and hundreds of local forms that differ in their inflorescence, fruit and seed characteristics.

Distribution and habitat

Believed to be native to tropical Africa, although it is found in its wild state in scrub forests of the outer Himalayas. It has been cultivated for its oil-yielding seeds in Africa and India for millennia and has been used for medicinal purposes since ancient times in India. Today it is widely distributed in the tropics and subtropics, including throughout India to an altitude of 2000 m, mostly under cultivation.

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Medicinal properties and uses

The seeds, flowers, roots and leaves are all used in traditional Indian medicine. In Ayurveda, the root is used to treat inflammations, fever, asthma, bronchitis, leprosy and diseases of the rectum; the leaves are considered useful for treating intestinal worms, strangury, night blindness and earache; the flowers are used to treat glandular tumours, anal troubles and vaginal pain; the fruit is prescribed for piles and diseases of the liver and spleen, and the seed oil is used to relieve tumours, inflammations, lumbago, leprosy, elephantiasis and convulsions. In Unani medicine the root bark is considered useful for treating skin diseases, the leaves are used as a galactagogue and for relieving burns, and the seeds and seed oil is used to treat liver diseases, body pains, lumbago, boils, piles, ringworm, paralysis, inflammations, ascites, asthma, rheumatism, dropsy and amenorrhoea. The oil obtained from the crushed seeds (*castor oil*) is used medicinally as a cathartic, and as a mild laxative for children. It is also used in small doses to induce labour in pregnancy at term. Castor oil is sometimes applied externally as a bland emollient in the form of a 5–10% ointment to treat seborrhoeic dermatitis and other skin afflictions. The seeds, made into a paste or poultice, are reportedly applied to relieve sores, boils and gouty or rheumatic swellings. The warmed leaves are applied to the abdomen to relieve postnatal pains by Bhil and Raibari women in Rajasthan; they are also commonly used as a poultice to relieve headache. Among the tribal inhabitants of north-central Uttar Pradesh, a decoction of the leaves and the whole plant of *Phyllanthus fraternus* (*Euphorbiaceae*) and *Eclipta alba* (*Asteraceae*) is given to treat jaundice and other liver diseases. In northeastern Karnataka the leaf extract mixed with milk, or mixed with the leaf extracts of *Calotropis procera* (*Asclepiadaceae*) and *Ocimum sanctum* (*Lamiaceae*), is also taken internally to treat jaundice.

References

Chopra *et al.* (1956, 1969), CSIR (1948–1992), Joshi (1989), Katewa and Arora (1997), Kirtikar *et al.* (1935), Seetharam *et al.* (1999), Singh and Prakash (1998), Sivarajan and Balachandran (1994), Yoganarasimhan (1996).

Sebastiania chamaelea (L.) Muell. Arg.

Botanical synonyms

Microstachys chamaelea (L.) A. Juss, *Tragia chamaelea* L.

Common name

Konkani: bhuierendi.

Description

An annual glabrous herb with a woody base, 30–60 cm tall; stems often grooved or ribbed. Leaves alternate, 2–7.5 cm long and 0.3–1.3 cm wide, linear or narrowly oblong-elliptic, margins finely serrate, apex obtuse or apiculate, base tapering, mid-nerve prominent beneath; petioles 2–3 mm long; stipules ovate. Flowers yellowish-green; male flowers in axillary or leaf-opposed short spikes, bracts very small, acute, calyx minute, membranous, lobes 5, ovate, acute, ciliate; female flowers usually solitary at the base of the male spikes or lateral on the branches without male flowers, sepals 3, larger than in the male, obovate, acute, ciliate. Fruits (capsules) 6–8 mm long, subglobosely oblong, with two rows of reddish warty outgrowths on each of 3 cocci; seeds 4 mm long, ellipsoid-oblong, rounded at both ends, yellow. Flowers and fruits between August and November.

Distribution and habitat

Widely distributed throughout the Old World tropics and subtropics from West

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Africa to New Guinea and Australia. In India it is found from Uttar Pradesh to West Bengal southwards through peninsular India to Tamilnadu and Kerala, typically in open, grassy habitats, occasionally in forests.

Medicinal properties and uses

A decoction of the plant in clarified butter (*ghee*) is considered tonic and is applied to the head to relieve vertigo. The juice of the plant is reportedly used as a remedy for diarrhoea and for syphilis, and mixed with wine as an astringent.

References

Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

Securinega leucopyrus (Willd.) Muell. Arg.

Botanical synonym

Flueggea leucopyrus Willd.

Common names

Gujarati: humri, shinavi; ***Hindi***: ainta, hartho; ***Kannada***: bilchuli, gudahale, huli, sooli; ***Malayalam***: perinklavu; ***Marathi***: kandekuvana, pamdharphali, posheri, vorepuvan; ***Punjabi***: bata, bhathi, gargas, girthan, kakun, vanuthi; ***Sanskrit***: bhuriphali, svetakamboja; ***Tamil***: kareioori, mappulanathi, pulanji, vellaippulanji; ***Telegu***: challamunta, mekarayi, puli, tellapulisaru, tellapulugudu.

Description

A large, rigid, deciduous bush or small tree, with slender, leafy branchlets usually ending in sharp spines. Leaves 1.6–2.5 cm long and 1.3–1.6 cm wide, obovate, elliptic or obcordate, glaucous and reticulately veined beneath, apex emarginate. Flowers very small, greenish-yellow, in axillary clusters arising from a crowd of minute bracts; male flowers numerous, female 1–5 together; pedicels up to 10 mm long in the male and rarely to 6 mm long in the female flowers; sepals 1.6 mm long, obovate-oblong, obtuse, concave. Fruits (berries) globose, up to 6 mm in diameter, white

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when ripe, fleshy, globose, smooth, 3-celled. Flowers and fruits between April and July in southern India.

Distribution and habitat

Occurs in open scrub and deciduous forests from Rajasthan and Punjab to Uttar Pradesh extending southwards through the western and southern regions of peninsular India; also found in Sri Lanka and Myanmar (Burma).

Medicinal properties and uses

A juice or paste of the leaves is used with tobacco to kill worms in sores. In Ayurveda the leaves are used to treat dysentery and digestive disorders. Both the leaves and (sweet) berries are edible.

References

Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

Tragia involucrata L.

Common names

Bengali: bichati; ***English***: Indian stinging nettle; ***Hindi***: barhanta; ***Kannada***: churachrikegida, dulagondi, haligilu, kiriberalu, sannaturachi, turachi; ***Malayalam***: cherukodithuva, chorinnanam, choriyanam, kotittuva; ***Marathi***: khajkolti; ***Oriya***: bichhuati; ***Sanskrit***: dhusparsha, duralabha, vrishchikali; ***Tamil***: kanjori, kannichi, punaikanjan; ***Telegu***: chinnaduradagunta, dulagundi, teegaduradagunta.

Description

An erect, trailing or climbing, perennial evergreen herb or shrub with slender stems covered with stinging hairs. Leaves alternate, 3–10 cm long and 1–5 cm wide, hairy, elliptic-lanceolate to broadly ovate, apex acuminate, base rounded or cordate, margins dentate or crenate-serrate; petioles 0.3–1.6 cm long. Flowers monoecious, yellowish, shortly pedicellate, borne in hairy, terminal, axillary or leaf-opposed racemes 2.5–5 cm long; male flowers on the upper and female on the lower part of racemes; bracts 2.5 mm long, lanceolate, acute. Male flowers: sepals 3, broadly elliptic or orbicular, concave, 1.5 mm long, glabrous. Female flowers: sepals 6, ovate, pinnatifid, very hispid, 3 mm long, elongating and becoming rigid in fruit. Fruit (capsule) 3-lobed, 0.8 cm in diameter, white, more or less hispid; seeds globose, smooth.

Distribution and habitat

Found throughout India from Punjab and the lower Himalayas to Assam and Meghalaya to an altitude of 750 m, and southwards to Kerala. It is typically a weed of cultivated fields and open, degraded sites, but is also fairly common in scrub forests in Karnataka. Also found in Sri Lanka, Myanmar (Burma) and southern China.

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Medicinal properties and uses

The roots possess diaphoretic and alterative properties. In Ayurveda they are considered useful for treating asthma, fevers, diarrhoea, excessive urination, vomiting and dermatosis; their infusion is given to promote perspiration in fevers, and to relieve itching of the skin. A decoction of the root (1 part root : 10 parts water) is reportedly useful for relieving bronchitis and attendant fever. In Chota Nagpur, the roots are used to relieve fever when the extremities are cold and also for pains in the arms and legs; in the form of an infusion they are given to treat diarrhoea and dysentery. Among the tribal inhabitants of southern and eastern Bihar, the fresh root mixed with black pepper is given for treatment of epilepsy as well as for snake bite. In the Konkan, a paste prepared from the roots is applied to facilitate extraction of guinea worms; mixed with the juice of *Ocimum sanctum* (*Lamiaceae*) the root paste is used to treat itchy eruptions on the skin. The leaves are used to treat headache. The fruit is an ingredient of a compound preparation known as *Kshara Guda*, used to treat enlarged spleen. The fruits, rubbed with water on the scalp, are reportedly useful for promoting hair growth in baldness.

References

Chopra *et al.* (1956), CSIR (1948–1992), Jha and Varma (1996), Kirtikar *et al.* (1935), Sivarajan and Balachandran (1994), Varma (1997), Yoganarasimhan (1996).

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Fabaceae-Caesalpinioideae

Bauhinia malabarica Roxb.

Botanical synonyms

Piliostigma acidum (Reinw. ex Korth) Benth., *P. malabaricum* (Roxb.) Benth.

Common names

Bengali: karmai; ***English***: Malabar bauhinia, mountain ebony; ***Gujarati***: khatimu, khatombo, khatomoi; ***Hindi***: amli, amlosa, amta, jhinjhora, kachnar; ***Kannada***: basavanapada, cheppura, kudugulu, mandara, pulikogelepukke; ***Malayalam***: arampuli, kokkavali, mandaram, minpuli; ***Marathi***: amboti, amli, korala, sehara; ***Oriya***: gohonoboroda, koteli; ***Sanskrit***: amlapatrakah, asmantaka, asmayokta; ***Tamil***: malaiyatti, mandarai, puliyatti, vattatti; ***Telegu***: are, pulhari, pulichinta, pulladanda, pullagoddukara, pullaninta, pullare.

Description

A small evergreen tree with greyish-brown bark. Leaves alternate, simple, 3.8–12.5 cm long and 4.5–15 cm wide, divided about one-quarter down into 2 rounded lobes, cordate at base, main nerves 7–11 (usually 9), glabrous above, pale and more or less pubescent beneath; petioles 2.5 cm long, thickened at both ends, channelled. Flowers white, borne in dense axillary subsessile racemes; pedicels 1.3–2.5 cm long, slender, brown-puberulous; calyx brown-pubescent, tube 3–6 mm long, turbinate, limb 6–8 mm long, divided into 5 linear segments; petals obovate-spathulate. Fruit (pod) straight, 25–30 cm long, stalked, somewhat turgid, glabrous, indehiscent, conspicuously marked with raised wavy lines descending from the middle to the edges of the pod; seeds 20–30, globose-ovoid, 4–5 mm in diameter, dark brown, polished. Salty leaf taste diagnostic for this species. In central India, flowering occurs mainly between September and November,

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and fruiting from December to February; in Karnataka, flowering and fruiting occur between August and April.

Distribution and habitat

Native to tropical Asia from India eastwards through Myanmar (Burma), Indochina, Thailand, Java, the Philippines and the Lesser Sunda Islands to northern Australia. It is found in peninsular India and in the western sub-Himalayan forests in moist sites in deciduous and semi-evergreen forests in areas receiving between 1000 and 3000 mm annual rainfall.

Medicinal properties and uses

In Ayurvedic medicine, the stem bark and flowers are used as a substitute for those of *Bauhinia variegata* to treat worm infestation, leprosy, wounds, menorrhagia, gout, scrofula, wasting diseases, cough, haemorrhage, urinary disorders, glandular swellings and goitre. An infusion of the leaves, or of the new flowers, is reportedly used to treat dysentery. In the Philippines, the leaves are used as a febrifuge.

References

Chopra *et al.* (1956), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

Bauhinia purpurea L.

Botanical synonym

Bauhinia triandra Roxb.

Common names

Bengali: deva-kanchan, koiral, rakta-kanchan; ***English***: butterfly tree, geranium tree, orchid tree; ***Hindi***: kaliar, kandan, kaniar, keelra, keolar, khairwal; ***Kannada***: baswanapada, kanchuvaala, kempukanjivala, kempumandaara, sarul; ***Malayalam***: chuvannamandaram, suvannamandaram; ***Marathi***: atmatti, devakanchana, rakta-kanchan; ***Oriya***: boroda, debokanjoro, konsonaro, sono; ***Punjabi***: kakar, karalli, karar, koiral, kolar; ***Sanskrit***: kanchan, kovidara, vanaraja; ***Tamil***: kalavilaichi, mandari, segappumandarai; ***Telegu***: bedatithachettu, bodanta, devakanjanamu, kanchanam, peddari.

Description

A small, usually evergreen, ornamental tree with dark grey or brown bark, pink to pale yellow inside. Leaves rigidly subcoriaceous, glabrous, 5.5–12 cm long and broad, divided into 2 lobes with almost angular tips, base shallowly cordate; basal nerves 9–11. Flowers varying in colour from white

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to purple, in terminal and axillary short-peduncled, few-flowered panicled racemes; calyx 2-cleft above; petals 5, equal, obovate-obtuse. Fruits (pods) firm, flat, glabrous, somewhat splashed with red when young, 15–30 cm long, dehiscent when mature, containing 12–15 flat, ovoid, beaked, seeds. Flowers from September to November; fruits mature from January to March in central India.

Distribution and habitat

Native to South and Southeast Asia, it is found throughout peninsular India in deciduous forests, usually scattered and nowhere very common, typically along watercourses. Planted as a garden ornamental throughout India to an altitude of 1300 m.

Medicinal properties and uses

The stem bark is credited with astringent properties and is used to treat diarrhoea. In Ayurveda it is used to treat ulcers, swellings, leprosy, cough, menstrual disorders, glandular diseases and prolapse of the rectum. Among the tribal inhabitants of southern Bihar, it is taken in powdered form for this purpose, and is applied to the forehead in the form of a paste to relieve headache. Mixed with curd (yoghurt), it is found to be useful for treating haemorrhoids; made into a paste with ginger, it is taken internally in the treatment of goitre. A decoction of the stem bark is a useful wash for ulcers. The flower buds are reported to have astringent, laxative and anthelmintic properties, and are used to treat haemorrhagic diseases, leucorrhoea and coughs. They are sometimes eaten as a vegetable and also pickled. In Dharmapuri district in Tamilnadu the leaf paste mixed with the latex of *Jatropha curcas* (*Euphorbiaceae*) is given as a remedy for jaundice. The root is considered carminative, but the root bark is poisonous. The stem bark and flowers are used in Ayurvedic medicine as a substitute for those of *Bauhinia variegata* to treat worm infestation, leprosy, wounds, menorrhagia, gout, scrofula, wasting diseases, cough, haemorrhage, urinary disorders, glandular swellings and goitre.

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References

Asolkar *et al.* (1992), Chatterjee and Pakrashi (1992), Chopra *et al.* (1956), CSIR (1948–1992), Jain *et al.* (1989), Kirtikar *et al.* (1935), Sivarajan and Balachandran (1994), Yoganarasimhan (1996).

Bauhinia racemosa Lam.

Botanical synonyms

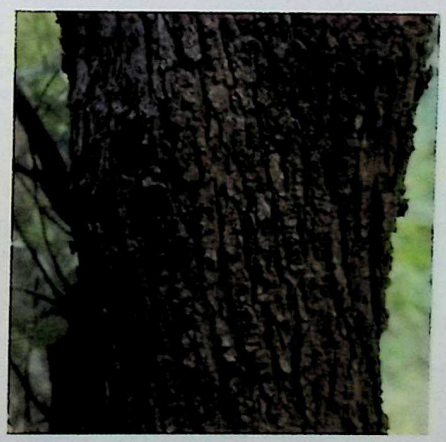
Bauhinia parviflora Vahl., *Piliostigma racemosa* Benth.

Common names

Bengali: banrai, banraj, banraji; ***Gujarati***: ashitri, ashintrao, asintro, asondaro, asundro, zanzaro; ***Hindi***: ashta, bhosa, dhorara, dhodri, dundra, gurial, jhinjri, kachnal, mohala, nathool, phalesa; ***Kannada***: arelu, aralukadumandara, banne, vana sampige; ***Konkani***: apta; ***Malayalam***: arambuli, kotapuli, mandaram; ***Marathi***: apta, bhosa, omboroda, sevara, wanurajan; ***Oriya***: ambhota, omboroda; ***Punjabi***: kosundra, taur; ***Sanskrit***: anupushpaka, asmantakah, svetakanchan, svetakanchana; ***Tamil***: araivatta-atthi, archi, areka, atti, sallagi, tadagi, vattaatti; ***Telegu***: are, ari, aro, pachare.

Description

A small, crooked, bushy, deciduous tree with drooping branches; bark bluish-black, rough, pinkish-red inside, turning brown on exposure. Leaves 2–4 cm long and 2–5 cm wide, divided to about one-third down into 2 lobes, rigidly coriaceous, base slightly cordate, basally 7- or 9-nerved, glabrous or sometimes pubescent beneath; stipules foliaceous. A dark spot at the base of the leaf base is diagnostic, distinguishing this species from *B. purpurea*, which has a light spot at the leaf base. Flowers yellowish- or greenish-white, 1.5–2 cm long, in short-peduncled, lax, terminal and leaf-opposed racemes. Fruits (pods) falcate, glabrous, turgid, indehiscent, 15–25 cm long and 1.5–2.5 cm wide, containing 12–20 dark reddish-brown, oblong seeds 6–10 mm long and 4.5–6 mm wide. Depending on locality, flowers from April to November (April to June in central India), and fruits from November to February. In central Indian deciduous forests, trees remain leafless for a short period between March–April and April–June.



Distribution and habitat

Native to South and Southeast Asia from Pakistan, India and Sri Lanka eastwards. Found throughout India to an altitude of

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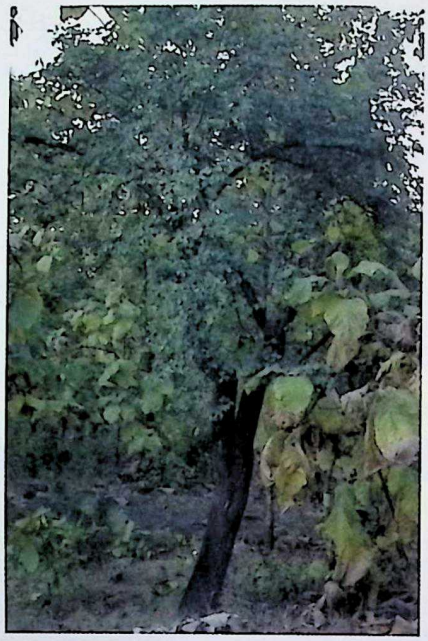
1650 m in the western Himalayas, and common in dry deciduous forest of peninsular India to an elevation of about 1200 m. It is sometimes planted for erosion control and as an ornamental in gardens.



Medicinal properties and uses

The stem bark and flowers are used in Ayurvedic medicine as a substitute for those of *Bauhinia variegata*. The bark is highly astringent and is used to treat dysentery; it also shows significant anti-inflammatory and cholagogue properties. It is used to treat glandular inflammation, ulcers, skin diseases, and is a useful remedy for goitre. Among the Bhils in Rajasthan, the stem bark is boiled and used as a vapour bath following childbirth for its reputed restorative and tonic action. Among the tribal inhabitants of Udaipur District in Rajasthan, an infusion of the stem bark is taken orally as a blood-purifier and a decoction of the fruit pulp is given to treat dysentery. The leaves are given with onion to treat diarrhoea and as an anthelmintic. A decoction of the leaves is given to relieve headache in malarial fevers. The flowers are used to treat haemorrhage, piles, cough, and as a laxative.

References

Asolkar *et al.* (1992), Chatterjee and Pakrashi (1992), Chopra *et al.* (1956), CSIR (1948–1992), Joshi (1989), Katewa and Arora (1997), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

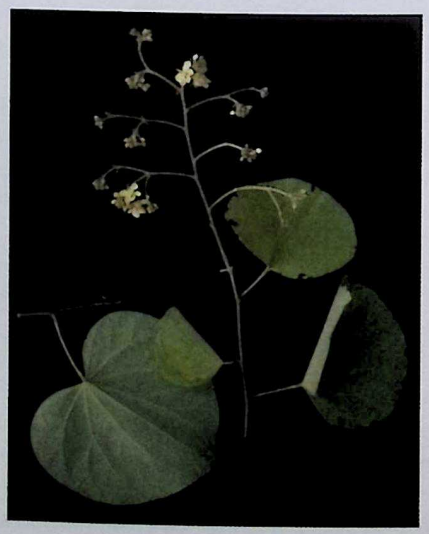
Bauhinia roxburghiana Voigt

Botanical synonyms

Bauhinia retusa Ham. ex Roxb., *B. semla* Wunderlin

Common names

Hindi: gwayral, kandlao, kandla, koilar, semla; ***Marathi***: koilar; ***Punjai***: kural; ***Telegu***: goddari, goddukura, hirpa, nirpayamu.



Description

A small to medium-sized deciduous or evergreen tree with dark brown or grey bark. Leaves rigidly coriaceous, 7.5–15 cm long, slightly broader than long, entire or notched at tip, cordate or

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truncate at base, glabrous; basal nerves 7–11; petioles 3.8–9 cm long, thickened at both ends. Flowers white or yellow, *c.* 1.8 cm across, borne in large terminal panicles; pedicels 1.5–2 cm long, silky-pubescent; calyx 5–7.5 mm long, pubescent, split almost to the base into 2–3 segments; petals twice as long as the calyx, long-clawed, obovate, hairy outside, the 3 upper mottled with purple. Fruits (pods) hard, flat, glabrous, 10–15 cm long and 3–3.8 cm wide, oblong or oblanceolate, broadest at the apex, 6–8-seeded; seeds 6–8, flat, suborbicular, dark brown, smooth. In central India it is evergreen in its native forest habitat, where it flowers between September and December and fruits from February to March.

Distribution and habitat

Found in the northwestern Himalayas up to 1500 m, and in the deciduous hill forests of Uttar Pradesh, Madhya Pradesh, Orissa and Andhra Pradesh. In peninsular India it is not common, and is usually confined to moister forest habitats such as valleys.

Medicinal properties and uses

The edible gum exuded from the cut bark is used as an external application to promote healing of sores, and is taken internally as an emmenagogue and diuretic.

References

Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935).

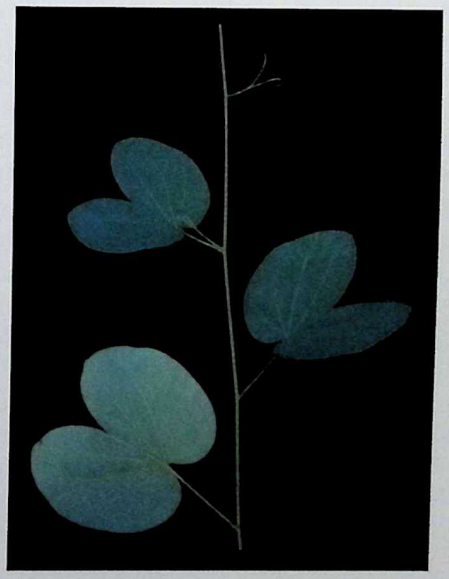
Bauhinia vahlii Wight & Arn.

Botanical synonym

Phanera vahlii Benth.

Common names

Bengali: chehur; ***English***: camel's foot climber; ***Gujarati***: chembelli; ***Hindi***: jallur, mahul, maldan, maljhan, malu; ***Kannada***: anepadu, anipadu, hepparige, kambihu; ***Malayalam***: mottanvalli; ***Marathi***: chambal, chambuli, chambura, mahul, maljan; ***Oriya***: shiali, shioli, sialpat, siyali; ***Punjabi***: marwar, taur; ***Sanskrit***: asmantaka, malanjhana, murva; ***Tamil***: mandarai, kattumanda; ***Telegu***: adda, addatiga, madaputige.



Description

A very large, usually evergreen, climber with stems up to 30 cm in diameter; bark dark reddish-brown or blackish, inner bark tough, fibrous, bright pink with white or yellowish bands that turn orange-brown on exposure; branchlets rusty-tomentose, often terminating in a pair of coiled tendrils. Leaves 10–45 cm long and about as wide, divided about one-third of the way down into 2 obtuse lobes, base deeply cordate, rigidly subcoriaceous, glabrescent above when mature, tomentose beneath, basal nerves 11–15; petioles 7.5–15 cm long, stout, tomentose. Flowers white or yellowish, 3.8–5 cm across, borne in densely tomentose subcorymbose racemes; pedicels 2.5–6.3 cm long. Fruits (pods) flat, woody, generally 15–30 cm long and 5–8 cm wide, rusty-velvety, dehiscent; seeds 6–12, suborbicular, 2.5 cm in diameter, flat, dark brown, polished. Flowers between April and June and fruits from December to March in central India.

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Distribution and habitat

Found in deciduous forests of India from Gujarat southwards to Maharashtra and northern Andhra Pradesh, commonly on hillsides and in forest valleys.

Medicinal properties and uses

The seeds are considered aphrodisiac and tonic. The leaves are demulcent and mucilaginous. An aqueous extract of the root is given orally for the treatment of syphilis among the Gonds of Uttar Pradesh. Among the Mundas in southern Bihar, a fine paste of the root is given with water to treat dysentery.

References

Asolkar *et al.* (1992), Chatterjee and Pakrashi (1992), Chopra *et al.* (1956), Kirtikar *et al.* (1935), Singh and Prakash (1994), Varma (1997).

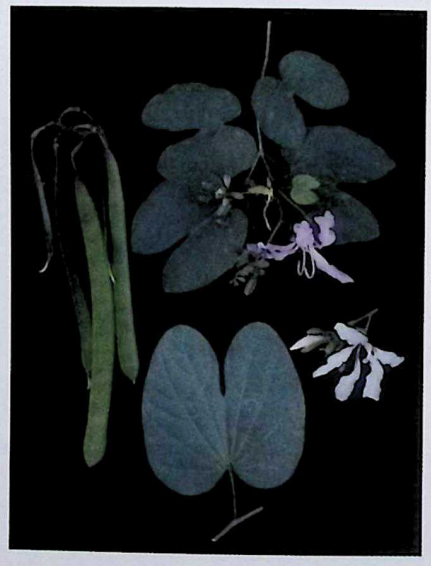
Bauhinia variegata L.

Botanical synonym

Bauhinia candida Roxb.

Common names

Bengali: ratkakamhar, raktakanchan, svetkanchan; ***English***: mountain ebony, orchid tree; ***Gujarati***: kovindara; ***Hindi***: barial, gurial, kachnar, kanchan, kanchanara, kaniar; ***Kannada***: arisinatige, bilikanjivala, kanchavala, kanchavalado, kempukanjivala, ulipe; ***Konkani***: kanchan; ***Malayalam***: chuvannamandaram, kovidaram, suvannamandaram; ***Marathi***: kachnag, kanarai, kanchan, raktakanchan, thaur; ***Oriya***: borara, boroda, kanjoni, kosonaro, rongakonjono; ***Punjabi***: kachnar; ***Sanskrit***: kancanara, kancanarah, kanchanara, kanchanarah, kodivar, kovidara, kodivarah; ***Tamil***: mandarai, segappumandarai, segapu-manchori, shemmandarai, vellaippuvatti; ***Telegu***: botantam, devakanchanamu, mandara, mandarai; ***Urdu***: kachnal.



Description

A small deciduous tree; bark nearly smooth, ashy to dark brown, pale pink inside. Leaves broader than long, 7.5–15 cm wide, divided one-third of the way down into 2 rounded lobes, rigidly subcoriaceous, base deeply cordate. Flowers white or light purple with one petal darker than the rest and variegated with yellow, fragrant, borne in few-flowered, lateral, sessile or short-peduncled corymbs. Pods 22–30 cm long, hard, flat, glabrous, with splashes of red or purple when still green, dehiscent when mature, 10–15 seeded. In central Indian

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deciduous forests, flowering occurs between February and April and fruiting from April to May; trees generally remain leafless between February and April–May in this region.

Distribution and habitat

Found in dry deciduous forests of the sub-Himalayan hills from the Indus eastwards to an altitude of 1300 m, and in peninsular India, typically on rocky hill slopes in dry forest regions. It is commonly planted as a garden and roadside ornamental throughout India and in many other tropical and subtropical countries.

Medicinal properties and uses

In Ayurveda two varieties are distinguished based on flower colour. The bark of both is considered alterative, tonic, astringent to the bowels, and used to treat biliousness, ulcers and tuberculous glands; that of the red-flowered variety is used to treat leprosy, while that of the white-flowered variety is used to treat leucoderma, cough, asthma, diseases of the blood, vaginal discharges, strangury and as an anthelmintic. An emulsion of the powdered bark, mixed with ginger in rice water, is used to treat scrofula and skin diseases. In Unani the bark is used for treating many of the same conditions, as well as dysmenorrhoea and menorrhagia. The flowers are edible and considered laxative; those of the red-flowered variety are used in Ayurveda to treat diseases of the blood, bronchitis, consumption, vaginal discharges, biliousness and headache. The dried flowers and buds are anthelmintic and used to treat diarrhoea, dysentery and piles. The root is considered carminative, and is used to treat dyspepsia and flatulence; the root juice is used in Ayurveda in the treatment of snake bite.

References

Asolkar *et al.* (1992), Chatterjee and Pakrashi (1992), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935), Sivarajan and Balachandran (1994), Yoganarasimhan (1996).

Caesalpinia bonduc (L.) Roxb.

Botanical synonyms

Bonduc minus Medik., *Caesalpinia bonducella* (L.) Fleming, *C. crista* L., *C. jayabo* Naza., *C. nuga* Ait. f., *Guilandia bonduc* L., *G. bonducella* L.

Common names

Bengali: nata, natakaranja, natukoranza; ***English***: bunduc nut, fever nut, physic nut; ***Gujarati***: gajga, kachki, kakachia, kakcha; ***Hindi***: gatan, gataram, kanja, karanju, kat-karanj, kat-karanja, sagargoti; ***Kannada***: gaja-gakayi, gajjiga, gazzaga, sannagajjiga, tapasi; ***Malayalam***: avil, kalanji, kalimarakam, kazhanchikkuru; ***Marathi***: gagaja, dagargoto, kalichikai, sagargoti; ***Oriya***: kotokoleja; ***Sanskrit***: kuberakshi, latakaranja, latakaranjah, putikaranja; ***Tamil***: avil, gajji, gujju, kachukkai, kalarsi, kazhichikai, suriyindu; ***Telegu***: gachchakaya, getsakeia, gutsakai, sukajambuka; ***Urdu***: akitmakit, bunduk.

Description

A large, prickly, prostrate or climbing, evergreen shrub up to 20 m tall. Branchlets finely grey-downy, armed with hooked and straight hard yellow prickles. Leaves alternate, bipinnate, 30–60 cm long, pinnae usually 6–8 pairs, 5–7.5 cm long with a pair of hooked stipulary spines at the base; leaflets 6–12 pairs per pinna, 2–3.8 cm long and 1.3–2.2 cm wide, membranous, elliptic-oblong, base rounded to acute, apex mucronate, margins curved, upper surface shiny, lower dull; petioles prickly; stipules a pair of reduced pinnae at the base of each leaf, 0.5–2 cm long, each with a long mucronate point. Flowers yellow,

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fragrant, borne in axillary and terminal racemes 15–60 cm long; bracts squarrose, linear, acute, to 1 cm long, fulvous-hairy; calyx 6–8 mm long, lobes obovate-oblong, obtuse; petals oblanceolate, yellow. Fruits (pods) somewhat swollen, oblong, 5–7.5 cm long and *c.* 4.5 cm wide, prickly, dark brown to black, 1- or 2-seeded, beaked; seeds orbicular or ovoid to reniform, black, polished, hard. Flowers from August to November and fruits from December to February in central India.

Distribution and habitat

A pantropical species, found wild throughout the plains of India and up to an altitude of 850 m in hedges and on wastelands near villages. Also found in the lowland alluvial, particularly coastal, regions of western, eastern and southern India. Commonly cultivated as a hedge plant.

Medicinal properties and uses

Bonduc nuts (fruits) have long been used as an antiperiodic in traditional Indian medicine. They also possess diuretic and antipyretic activity, and are used in Ayurveda for treating diarrhoea, intestinal worms, hydrocele, anasarca, liver and spleen diseases, diabetes, leprosy and piles. The seeds have a bitter taste, are valued in traditional medicine as a tonic, and are recommended for treating fever, asthma and colic. They are an ingredient of several Ayurvedic preparations, including *Ayush-64*, used as an anti-malarial drug. Made into an ointment, they are used to treat hydrocele. As an infusion, they are used to treat cerebral haemorrhage and infantile convulsions. A paste prepared from the seeds is applied externally to treat hydrocele among the Irulars in Tamilnadu and to promote healing of boils among the inhabitants of Bhadrak District in Orissa; mixed with oil, the pounded seed kernels are used to relieve body-ache among the tribal inhabitants of Surguja District in northeastern Madhya Pradesh. The seeds are reported to be abortifacient. In Jammu and Kashmir, the plant juice is prescribed after meals for 2 weeks to treat intermittent fever. In Sri Lanka, the plant is used in traditional medicine for the treatment of skeletal fractures. The seed oil is emollient and used for stopping discharge from the ear, for removing facial freckles and for treating skin diseases; it is also antirheumatic and compares favourably with phenylbutazone. The tender leaves are used to treat liver disorders; boiled with castor oil or butter fat, they are applied externally to relieve painful and swollen testicles. The leaves and bark are emmenagogue, anthelmintic and febrifuge. The leaves are used in the treatment of piles, worms and oedema. A decoction of the root is used to treat bladder stones; mixed with honey, the root is used to cure leucorrhoea.

References

Asolkar *et al.* (1992), Chatterjee and Pakrashi (1992), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Girach *et al.* (1997), Kirtikar *et al.* (1935), Kumar and Jain (1998), Ragupathy and Mahadevan (1991), Sivarajan and Balachandran (1994), Yoganarasimhan (1996).

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Caesalpinia coriaria (Jacq.) Willd.

Common names

Bengali: tauri; ***English***: American sumac, dividivi plant; ***Kannada***: dividivi, vilayatiyaldekayi; ***Marathi***: dibi-dibi; ***Oriya***: gilo, tari; ***Tamil***: inkimaram, kodichittal, kodivelam, konnakkay, mullilladevaltividivi; ***Telegu***: dividivi, dividivitumma.

Description

An exotic, medium-sized tree with a short, crooked bole and wide-spreading, drooping branches; bark grey-brown, rough, corky, peeling off in small, irregular flakes. Leaves bipinnate, pinnae 3–9 pairs, 15 cm long; leaflets 15–28 pairs, oblong-linear, brownish-green or with black dots on lower surface, and dark green above. Flowers pale green or yellow (sometimes white), fragrant, in short terminal and axillary panicles. Fruits (pods) 5–8 cm long, strap-shaped, flexuous and twisted, not covered with prickles, 1–10 seeded. Flowers from July to November and fruits in December.

Distribution and habitat

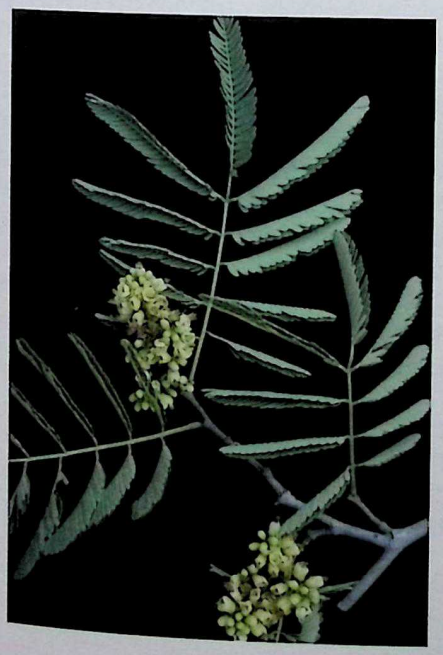
Native to South America and the West Indies, and introduced to India during the 19th century, where it is grown for ornament in gardens in various parts of the country, particularly in Andhra Pradesh and Tamilnadu. Sometimes used for coffee shade, and occasionally naturalized in Uttar Pradesh, West Bengal, Gujarat and Karnataka.

Medicinal properties and uses

The pods are astringent, antiperiodic and tonic. Their decoction is used for washing bleeding piles and atonic abscesses. The bark is antiperiodic, and is used to treat chronic fever. In Siddha, the pods are used to treat stomatitis and ulcers. Rich in tannins (28–41% by weight), they are also highly valued by the tanning industry.

References

Asolkar *et al.* (1992), Chatterjee and Pakrashi (1992), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).



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Caesalpinia decapetala (Roth) Alston

Botanical synonyms

Caesalpinia sepiaria Roxb., *Reichardia decapetala* Roth.

Common names

English: black bonduc, Mysore thorn; ***Gujarati***: chilar, kirmich; ***Hindi***: aila, karanj, kirkich, relu, uri; ***Kannada***: gajalige, hotasige, kurudugajjida; ***Malayalam***: inna; ***Marathi***: chillara, chillari, chillati; ***Oriya***: gilo, godhchili; ***Punjabi***: karur, relan; ***Sanskrit***: karanjika; ***Tamil***: indu, kadiyindu, pulitadukki; ***Telegu***: gaddakorinda; ***Urdu***: aila.

Description

A robust, thorny, climbing shrub up to 25 m tall; stem stout, woody; branchlets downy, armed with strong, sharp, yellowish hooked prickles. Leaves 25–50 cm long, bipinnate, rachis armed with prickles; pinnae 3–10 pairs, hairy, often armed, 5–7.5 cm long; leaflets 5–12 pairs, membranous, 1.3–2 cm long and 5–8 mm wide, elliptic to elliptic-oblong, base rounded, apex truncate to retuse, glabrous; stipules lunate or obliquely semi-cordate, 0.8–1.3 cm long and 0.3–0.7 cm wide, acuminate. Flowers bright yellow or dark red, in conspicuous axillary and terminal racemes 15–30 cm long; pedicels 1.3–2 cm long, densely pubescent; bracts 1 cm long, ovate-lanceolate, densely pubescent; calyx 1–1.3 cm long, densely pubescent, the upper sepals oblong, obtuse, pubescent; corolla 1.3–2.2 cm across, petals suborbicular, bright yellow. Fruits (pods) 7.5–10 cm long, linear-oblong, winged, beaked, 4–9-seeded; seeds ellipsoid, dull black.

Distribution and habitat

Native to tropical and subtropical Asia but widely introduced and naturalized in Africa and the Pacific region. Commonly found wild throughout peninsular India in open habitats and in thickets to an altitude of 1800 m; commonly planted in hedges throughout India.

Medicinal properties and uses

In Unani medicine the leaves are considered laxative, tonic, carminative, antipyretic, emmenagogue and useful for treating biliousness. A decoction of the plant is used as a bath in cases of jaundice. The leaves and root are used as a purgative and emmenagogue. The bruised leaves are applied to relieve burns in Himachel Pradesh. They are slightly sweet and are useful in treating biliousness. A decoction of the leaves is used to treat stomach disorders.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935).

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Caesalpinia pulcherima (L.) Sw.

Botanical synonym

Poinciana pulcherrima L.

Common names

Bengali: krishnachura; ***English***: Barbados pride, peacock flower; ***Gujarati***: galtora, sandhesharo, shankasur; ***Hindi***: guletura, gulutura; ***Kannada***: kenjige, kenji gida, komari, ratnagandhi; ***Malayalam***: mayilkonna, settimandaram, techimandaram; ***Oriya***: krishnochuda; ***Sanskrit***: padandam, ratnagandhi; ***Tamil***: mayirkonnai, mayuram, nalal; ***Telegu***: pamiditangedu, ratnagandhi, sinnaturayi, turayi.

Description

An exotic, drought-resistant shrub or small tree up to 5 m tall; branchlets glossy, unarmed or armed with a few straight prickles. Leaves large, bipinnate, either unarmed or armed with a few prickles paired at the base of pinnae; rachis 20–30 cm long; pinnae 5–10 pairs; leaflets 6–12 pairs per pinna, 1.3–1.9 cm long, base rounded, apex rounded to retuse, mucronate. Flowers borne in terminal and axillary, pyramidal racemes 20–50 cm long, rarely armed with a few straight prickles; calyx 1.3–1.6 cm, glabrous; petals round, crisped, yellow, orange-red or red with a yellow border and long red or yellow filaments, claw distinct, showy. Fruits (pods) woody, thin, beaked, ligulate, up to 8 cm long, 8–10-seeded; seeds rectangular, black. Flowers September–November and fruits March–April.

Distribution and habitat

Presumed to be native to tropical America but widely distributed throughout the tropics and subtropics. Cultivated throughout India in gardens; occasionally naturalized.

Medicinal properties and uses

An infusion of the flowers is used as a pectoral and febrifuge, and in the treatment of bronchitis, asthma, intestinal worms and malarial fevers. The leaves are purgative, tonic and emmenagogue. The bark is highly astringent, and used as an abortifacient and emmenagogue. The powdered seeds are reportedly a remedy for stomach-ache.

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References

Asolkar *et al.* (1992), Chatterjee and Pakrashi (1992), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935).

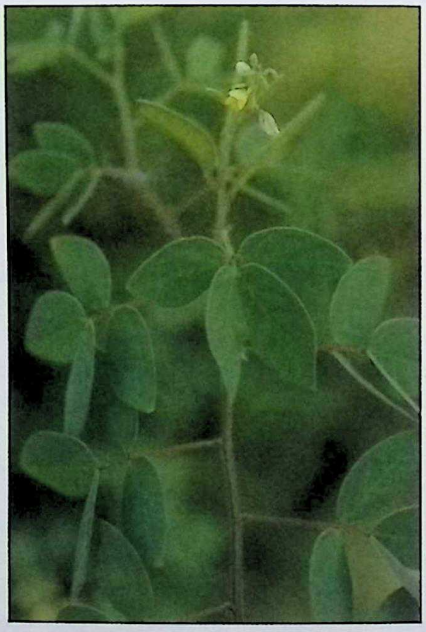
Cassia absus L.

Botanical synonym

Chamaecrista absus (L.) Irwin & Barneby

Common names

Bengali: chaksu; ***Gujarati***: chimar, chimed, chinol; ***Hindi***: banar, chaksu, chakut; ***Kannada***: kankuti; ***Malayalam***: karinkolla; ***Marathi***: chaksie, kankuti; ***Punjabi***: chaksu; ***Sanskrit***: aranyakulattika, chakshushya, kulatthika; ***Tamil***: edikkol, karunganam, karunkanam, kattukol, mulaippalvirai; ***Telegu***: chanupalavillulu; ***Urdu***: chaksu.



Description

An erect, annual herb, 15–60 cm tall, stems and branches covered with grey, bristly, viscous hairs. Leaves paripinnate; rachis bearing a linear gland between leaflets of one or both pairs; leaflets 2 pairs, membranous, 1.6–4 cm long and 0.8–2.5 cm wide (the terminal pair the largest), elliptic to elliptic-obovate, apex rounded, base asymmetrical; petioles 2–2.5 cm long, slender; stipules linear-attenuate, 2.5–4 mm long and 1 mm wide, persistent. Flowers yellow or reddish-yellow, borne in narrow leaf-opposed, few-flowered racemes 2–13 cm long; calyx hairy, 4 mm long, segments oblong, obtuse, subequal; petals 6 mm long, obovate-cuneate, reddish-yellow, tender, veined. Fruits (pods) compressed, thin, linear oblong, 2.5–4.5 cm long, clothed with bristly hairs, elastically dehiscent; seeds 5–8 per pod, obovate or rhombic, dark brown, shining. Depending on locality, flowers and fruits from August to February.

Distribution and habitat

A widely distributed weed of the Old World tropics, introduced and naturalized in some areas of the American tropics. Found throughout most of India, commonly in open habitats and wasteland, ascending up to 1500 m in the Himalayas.

Medicinal properties and uses

The bitter, astringent leaves are used as a purgative and as a remedy for coughs,

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asthma and bronchitis. Application of the powdered leaves is reported to heal venereal ulcers and haemorrhoids. The seeds are slightly mucilaginous and bitter, astringent, stimulant and diuretic. They are used as a cathartic in cases of habitual constipation, and for the treatment of ringworm, venereal ulcers and other skin diseases, for relieving pains, headache, bronchitis, leucoderma, asthma, haemorrhoids and as an anthelmintic. The seed extract is used to purify blood and to treat mucous disorders. A decoction of the seeds is used to treat certain eye diseases. The baked, powdered seed kernels are used in the treatment of ophthalmia and conjunctivitis. In the Unani system of medicine, the plant forms a constituent of a compound drug used to treat leprosy.

References

Asolkar *et al.* (1992), Bhatt *et al.* (1999), Chatterjee and Pakrashi (1992), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935), Vijaya Kumar and Pullaiah (1998), Yoganarasimhan (1996).

Cassia auriculata L.

Botanical synonym

Senna auriculata (L.) Roxb.

Common names

Bengali: tarwar; ***English***: tanner's cassia, tanner's senna; ***Gujarati***: aval, awal; ***Hindi***: awal, tarval, tarwar; ***Kannada***: avarike, honnavarike, ollethangadi, sukusina, tangadi; ***Malayalam***: avara, aviram, ponnaviram; ***Marathi***: arsual, taravada, taroda, tarwad; ***Sanskrit***: avartaki, avarttaki, awarteki; ***Tamil***: avarai, avaram, avirai, sadurguli, semmalai; ***Telegu***: merakatangedu, tangedu, tangera.

Description

A fast-growing, profusely branched, evergreen shrub or small tree up to 7 m tall, with smooth, reddish-brown bark. Leaves 7–12 cm long; stipules large, persistent, 0.7–2.2 cm wide, reniform-rotund with a filiform point up to 0.7 cm long, at base of petioles; leaflets 6–13 pairs, slightly aromatic, oblong-obovate, obtuse or emarginate, 1–3.5 cm long and 1–2 cm wide, with an erect, orange gland between each pair of leaflets. Flowers yellow, up to 5 cm across, in compound, terminal, corymbose racemes; pedicels 2–2.5 cm long; bracts ovate, acuminate, caducous; calyx glabrous, segments leathery, concave, the outer 2 smaller than the other 3; petals with long claws, crisped at the margins, bright yellow veined with orange. Fruits (pods) pale brown, oblong, obtuse, mucronate, 5–15 cm long and 1.2–1.8 cm wide, flat, papery, flexible, containing 6–20 compressed seeds, tapering towards the base. Flowers from October to May; fruits mature from January to June, depending on locality.

Distribution and habitat

An Indo-Malaysian species native to India and Sri Lanka and introduced to various

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parts of Southeast Asia, it is found in the dry zones of peninsular India as far north as Rajasthan. Typically found along roadsides and other open degraded habitats and in scrub forests, usually on dry, sandy or stony soils. It is particularly common in Andhra Pradesh, Tamilnadu and Karnataka. Also cultivated for ornament in gardens and hedges in northern India from Harayana to West Bengal.

Medicinal properties and uses

The bark is astringent and used in gargles to treat sore throat, in enemas, and in the treatment of rheumatism and eye diseases; among the Kathodias of Rajasthan, it is given orally to treat coughs and colds. It is an ingredient of a compound preparation used to treat diabetes. Its decoction is given to relieve stomach-ache and the juice of the fresh bark for dysentery. The leaves are considered anthelmintic and useful for treating ulcers, swellings, boils, skin diseases and leprosy; their infusion possesses slight purgative properties. In northeastern Karnataka the powdered leaves and those of *Diospyros chloroxylon* (*Ebenaceae*) are applied externally with coconut oil to relieve pain associated with injuries. The pods are anthelmintic and emetic and used for treating urinary discharges. The seeds are considered alexipharmic and cooling, and are used to treat chronic purulent ophthalmia and conjunctivitis, gout, gonorrhoea, dysentery, cough and asthma; they are widely used to treat diabetes. The roots are considered astringent, alexiteric and useful for treating urinary discharges, skin diseases and asthma. A decoction of the roots is used as a tonic. In Maharashtra a decoction of the roots mixed with those of *Maytenus emarginatus* (*Celastraceae*) is taken internally to relieve rheumatic pains. The flowers are astringent and used for treating throat troubles, diabetes and urinary disorders. An aqueous extract of the flowers and leaves possesses hypoglycaemic activity. The tannin-rich bark, known commercially as *avaram bark* or *tangeedu bark*, is highly valued for tanning in South India.

References

Asolkar *et al.* (1992), Bhatt and Mitaliya (1999), Bhatt *et al.* (1999), Chopra *et al.* (1956), CSIR (1948–1992), Jain *et al.* (1989), Joshi (1989), Kirtikar *et al.* (1935), Seetharam *et al.* (1999), Yoganarasimhan (1996).

Cassia fistula L.

Botanical synonyms

Cassia rhombifolia Roxb., *Cathartocarpus fistula* (L.) Pers.

Common names

Bengali: amultas, amultush, bandarlathi, sonali, sonalu, sundali; ***English***: golden-shower, Indian laburnum, purging cassia; ***Gujarati***: balla, garmalo, girmala; ***Hindi***: amaltas, bandarlauri, dhan buhar, girmalah, kirwara, warga; ***Kannada***: kakke, kakkigida, konne, rajataru; ***Konkani***: baio, ballo, bavo; ***Malayalam***: kanikkonna, konna, kritamalam, svarnaviram; ***Marathi***: bahala, bahawa, bhava, boya, chimkani; ***Oriya***: sandari, soturongulo, sunari; ***Punjabi***: alash, ali, amaltash, kaniar, karangal, kariar, kiar; ***Sanskrit***: aragvadha, aragvadhah, sampaka, suvarnaka, vyadhighata; ***Tamil***: arakkuvadam, kavani, konnei, sarakkondai, sarakonnai, tirrukontai; ***Telegu***: aragvadhamu, kolaponna, rela, rellachettu, suvarnam; ***Urdu***: amaltas.

Description

A small to medium-sized, usually evergreen tree up to 24 m tall, with smooth, grey bark exfoliating in small, woody scales up to 1.5 cm thick. Leaves paripinnate, 20–40 cm long, rachis and petioles glandless, leaflets 3–8 pairs, distinctly stalked, 5–15 cm long and 3.5–9 cm wide, oblong or ovate, apex acute, base acute to cuneate, clothed with silvery pubescence when young. Flowers bright

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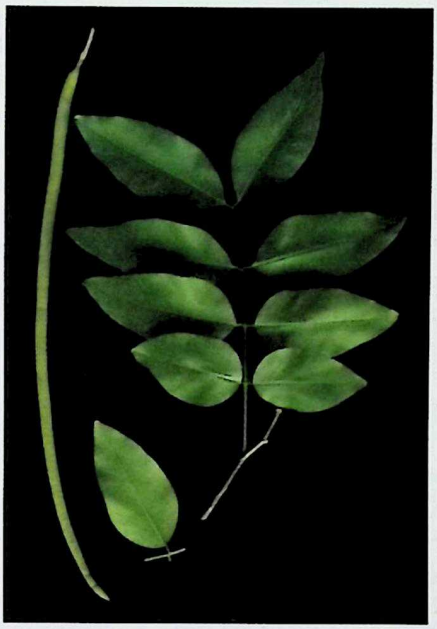
yellow, in axillary, pendulous, many-flowered lax racemes 10–40 cm long; sepals 5, green, pubescent, ovate or oblong-obtuse; corolla of 5 free, subequal, short-clawed, reddish-veined petals. Fruits (pods) cylindrical, pendulous, usually 25–30 cm long and 1.5–3 cm in diameter, dark brown or black. Seeds small, flat, smooth, light brown, shiny, 40–100 per pod, embedded in a sweetish black pulp. Flowers from April to October; fruits mature from December to April, depending on locality. In central Indian deciduous forest regions, trees remain leafless for a short period between April–May and May–June.



Distribution and habitat

Probably native to Southeast Asia but now distributed throughout the tropics, where it is cultivated as an ornamental plant. Wild and cultivated throughout India in mixed deciduous forests and hilly tracts to an altitude of 1200 m in the outer Himalayas. Common throughout the Gangetic valley, central and southern India.

Medicinal properties and uses

The dried pods and pulp are valued for their laxative properties. The pods and bark exhibit antiviral activity. A decoction of the pods is prescribed for pneumonia and common fever. The heated pods are applied to swellings on the neck due to cold. The pulp is considered a safe purgative, recommended for pregnant women and children to relieve disorders of the liver and biliousness. It is also applied externally to treat gout and rheumatism, and may safely be used as an analgesic. As an antipyretic, it is a remedy for malaria and blackwater fever. It is also used to treat leprosy and diabetes, and for the removal of abdominal obstructions. The slightly sweet seeds possess laxative, carminative, cooling and antipyretic properties; they are used to relieve constipation and to treat jaundice, biliousness, skin diseases and swollen throat. The powdered whole seeds are a cure for intestinal amoebiasis. The bark possesses antidysenteric and tonic properties, and is reportedly eaten raw to treat stomach-ache. In Ayurveda it is used to treat skin diseases such as eczema and leucoderma, diabetes, dysuria and arthritis. The powder or decoction of the bark is prescribed in the treatment of leprosy, jaundice, syphilis and heart disease. The powdered wood is reportedly used for dysentery, and its ash is used as a caustic to promote healing of open abscesses. The leaves possess antiperiodic and laxative properties, and are used in the treatment of jaundice, piles, rheumatism, and externally for skin eruptions, ulcers, wounds, ringworm, eczema, prurigo and pruritis. However, a paste of the fresh leaves is used internally by tribal

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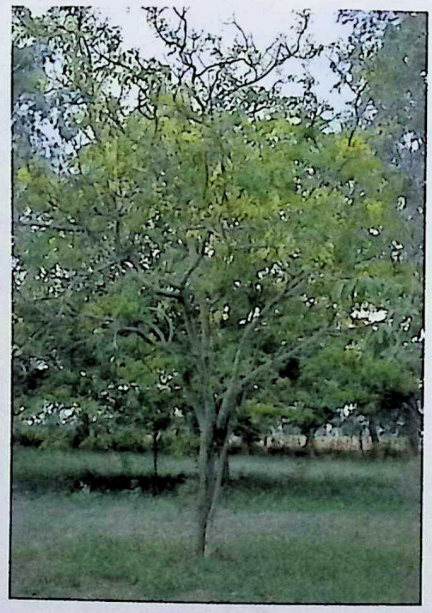
women in central Orissa as a reputed cure for amenorrhoea. A poultice of the leaves is used to treat chilblains. The leaves and bark, mixed with oil, are applied to pustules, insect bites and to reduce inflammation in cases of facial paralysis. Taken internally, the leaf juice is given to treat paralysis and to cure ringworm. The root and root bark possess astringent, tonic, febrifugal and purgative properties. The root is useful for treating cardiac disorders, biliousness, rheumatic conditions, haemorrhages, wounds, ulcers and boils, tubercular glands and various skin diseases; it is also reported to be useful for leprosy. The root, pounded together with that of *Cryptolepis buchanani* (*Asclepiadaceae*), is given as an antinarcotic to revive the nervous system paralysed by alcohol intoxication among the tribal inhabitants of southern Bihar. In northeastern Karnataka the pounded roots, mixed with goat's milk, are given in small doses on a regular basis to treat breast diseases. The aqueous extract of the root bark exhibits anti-inflammatory activity. The edible flowers possess astringent, purgative, febrifugal and antibilious properties. A decoction of the flowers is prescribed for stomach ailments.



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Asolkar *et al.* (1992), Chatterjee and Pakrashi (1992), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Girach and Aminuddin (1995), Kirtikar *et al.* (1935), Kumar and Jain (1998), Sahoo and Mudgal (1995), Seetharam *et al.* (1999), Sivarajan and Balachandran (1994), Yoganarasimhan (1996).

Cassia mimosoides L.

Botanical synonym

Cassia angustissima Lam.

Common names

Tamil: nirutti; ***Telegu***: nelaponna.

Description

A diffuse, annual or perennial herb, usually erect, up to 1 m high, pubescent. Leaves 4–10 cm long, with a concave gland just below the lowest pair of leaflets; upper surface of rachis usually serrate- or crenate-crested between the leaflets; leaflets generally 30–50 pairs, crowded, overlapping, linear-oblong, rigidly coriaceous, 2–9 mm long and 0.5–2 mm wide, apex acute, mucronate; stipules linear, attenuate, up to 1 cm long, persistent. Flowers yellow, solitary or in groups of 2–3, axillary; bracts linear-attenuate, about 2–5 mm long, at base of pedicels; sepals about 8 mm long,

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sometimes reddish, petals yellow, 4–13 mm long, stamens 10, unequal. Fruits (pods) flat, linear or linear-oblong, moderately pubescent, dehiscent, about 3.5 cm long and 0.6 cm wide; seeds *c.* 20, brown, rhombic, 2–4 mm long and 1–2 mm wide.

Distribution and habitat

A palaeotropical weed, it is found almost throughout India to an altitude of 2000 m in the Himalayas and up to 1800 m in the Western Ghats.

Medicinal properties and uses

The pulverized leaves are used for dressing wounds and sores, and the roots are used to treat diarrhoea and spasms. Among the Santals, the root is used to relieve stomach spasms. In Japan, a decoction of the leaves is used as tea.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935).

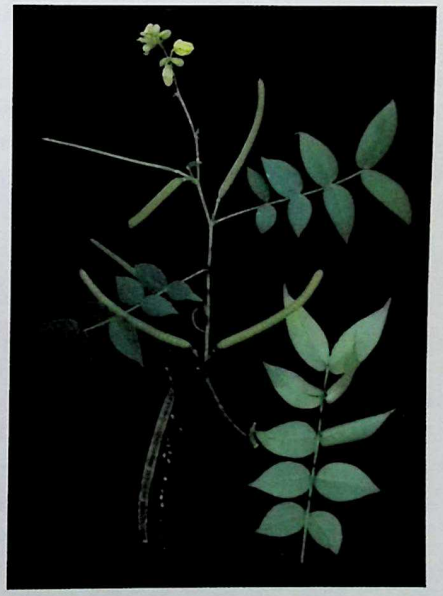
Cassia occidentalis L.

Botanical synonym

Senna occidentalis (L.) Link

Common names

Bengali: bara kalkesenda, kalkashunda; ***English***: coffee-senna, fetid senna; ***Gujarati***: kasodari, kasundari, kasundro; ***Hindi***: barikasondi, chakunda, kasonda, kasondi; ***Kannada***: anesogate, doddathagachi, doddatagase, kolutagase, uresogate; ***Malayalam***: karintakara, mattantakara, natram-takara, peyaviram, ponnaviram; ***Marathi***: kasoda, rankasvinda; ***Oriya***: kasendri, kasundri; ***Sanskrit***: kasamarda, kasamardah; ***Tamil***: nattam-takarai, nattandagarai, paravirai, payaverai, ponnavarai, ponthagarai; ***Telegu***: cashanda, kasinda, peddakasinda; ***Urdu***: kasonji.



Description

An erect, fetid, woody herb or undershrub, 60–150 cm tall, with a smooth, purplish or green stem. Leaves alternate, pinnate, 15–20 cm long, stipulate with a sessile dark brown gland near the base of the petiole; leaflets 3–5 pairs, opposite, short-stalked, membranous, ovate or lanceolate, 3–9 cm long and 1.5–4 cm wide, base rounded, apex acute or attenuate, glabrous above, glaucous beneath. Flowers yellow, in short, few-flowered axillary or terminal racemes; pedicels spreading, 5 mm long, elongating to 1.3 cm in fruit; bracts 1.3 cm long, ovate, acuminate, caducous, white tinged with pink; calyx

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1 cm long, divided to the base, glabrous, segments 5, white or creamy-yellow tinged with pink, oblong, obtuse, membranous; petals 5, subequal, 1.3 cm long, ovate-oblong, obtuse, yellow with faint orange veins. Fruits (pods) recurved, glabrous, compressed, 10–13 cm long and 0.8 cm wide, containing numerous dark olive-green, ovoid, compressed, smooth, hard, shiny seeds *c.* 6 mm long and 4 mm wide. Flowers and fruits throughout the year depending on locality, but mainly between August and January in central India.

Distribution and habitat

Pantropical in distribution, and found throughout India as a weed in waste places and near dwellings from the Himalayas to Cape Comorin, up to 1500 m elevation in northern India.

Medicinal properties and uses

All parts of the plant have similar medicinal properties, and are considered purgative, tonic, febrifugal, expectorant and diuretic. The plant is used as a vermifuge and to treat sore eyes, haematuria, rheumatism, dropsy, typhoid, asthma, blood disorders, and is reportedly effective against leprosy. A decoction of the plant is used for the treatment of hysteria, dysentery and other stomach troubles, and as an external application for relieving sores, itching and rectal inflammation. It is used with other plant ingredients to prepare an ointment used for various skin diseases. It forms part of a patented herbal drug (*Liv-52*) that is effective in treating early cases of hepatic cirrhosis having steatorrhoea. An infusion of the bark is given in diabetes. The volatile oil obtained from the leaves, roots, and seeds has antibacterial and antifungal properties. The leaves have purgative, febrifugal, tonic, sudorific, diuretic and stomachic properties; they are used to treat cough and hysteria. A lotion prepared from the leaves is used as an eyewash in tetanus. The leaves are used both externally and internally to treat itches, scabies and ringworm. A decoction of the leaves is used a mild febrifuge for children; the hot decoction is used as an antiperiodic. The fresh leaves, pounded with salt and onions, are applied as a poultice to guinea-worm sores to expel the worms. Among the tribal inhabitants of Udaipur District in Rajasthan, a poultice of the leaves and flowers is used to treat eczema. The leaves are also used externally to relieve inflammatory swellings, rheumatism, wounds and sprains, and are also given in the treatment of jaundice, pleurisy, headache and toothache. The leaf paste is applied externally to promote healing of bone fractures. Among the Kadars of the Anamalai Hills in Tamilnadu, a paste prepared from the leaves and roots is used externally along with hot water baths to relieve body swelling. The seeds are bitter and have tonic, febrifugal and purgative properties. They are considered a blood tonic and an excellent diuretic, and are also used to treat cough, whooping cough, convulsions and certain heart diseases. The powdered seeds are applied externally for treating skin diseases and eruptions. The roasted seeds, which lack the purgative properties of fresh seeds, are widely recognized as a tannin- and caffeine-free substitute for coffee in Africa and Arabia. They are given in powdered form to relieve stomach pain among the tribal inhabitants of eastern Bihar. The roots are considered bitter, tonic, purgative, anthelmintic and diuretic. In Ayurveda a paste made from the roots is considered a specific for ringworm, eczema and other skin ailments. They are given with lime to treat dysentery and diarrhoea associated with malaria, and for relief of cough, cramps, itches, and in leprosy. The roots are sometimes chewed to relieve sore throat. The pounded root, mixed with black pepper, is used for the relief of headaches, and is given to nursing women for purification of the milk. The root bark is used as a quinine substitute to cure fever, and its decoction is used as a stimulant and as a specific medicine for gonorrhoea and hepatic troubles.

References

Asolkar *et al.* (1992), Bhatt and Mitaliya (1999), Chatterjee and Pakrashi (1992), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Jha and Varma (1996), Katewa and Arora (1997), Kirtikar *et al.* (1935), Rajendran and Henry (1994), Sivarajan and Balachandran (1994), Varma (1997), Yoganarasimhan (1996).

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Cassia pumila Lam.

Common names

Gujarati: chamedian, chamediyun; ***Kannada***: dodda thagasi, nelatagache, nelatogaci; ***Marathi***: sarmal; ***Telegu***: nallajiluga.

Description

A prostrate, suberect or erect herb; stems numerous, spreading, *c.* 30 cm long; branches slender, clothed with white hairs. Leaves 2–5 cm long, rachis hairy, common petiole 3–4 mm long with a stalked gland on the petiole below the leaflets; stipules 5 mm long, lanceolate, acute; leaflets 10–20 pairs, 6–13 mm long and 2.5–3 mm wide, linear-oblong, very unequal-sided, apex rounded and apiculate, nerves conspicuous beneath. Flowers yellow, usually solitary or 2–3 together, supra-axillary; pedicels very short, slender; bracts beneath the pedicels lanceolate; calyx divided to the base, 2.5–3 mm long, pubescent, segments oblong-lanceolate, acute, subequal; petals 4 mm long, yellow, obovate-cuneate, tender, veined. Pods 2.5–3.8 cm long and 0.4–0.5 cm wide, with oblique partitions between the seeds, linear, flat, glabrous or with a few scattered hairs; seeds 6–12, brown, obovoid-cuneate, compressed, rectangular, shiny.

Distribution and habitat

Widely distributed throughout tropical

Asia and Australia, it is found almost throughout India to an altitude of 2100 m.

Medicinal properties and uses

The herb reportedly possesses central nervous system (CNS)-depressant activity. The seeds are sometimes given as a purgative.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

Cassia siamea Lam.

Botanical synonyms

Cassia florida Vahl, *C. sumatrana* Roxb., *Senna siamea* Irwin & Barneby, *S. sumatrana* Roxb.

Common names

Bengali: minjri; ***English***: ironwood tree, Siamese senna; ***Gujarati***: kasid; ***Kannada***: hiretagadi, simatangedu, simethangadi; ***Malayalam***: manjakonna; ***Marathi***: kassod; ***Tamil***: beati, manjakonnai, ponavari, simaiavari, vakai; ***Telegu***: simatangedu.

Description

A small or medium-sized, evergreen tree up to 18 m tall, with nearly smooth, slightly fissured grey bark. Leaves paripinnate, 12–30 cm long, leaflets 6–14 pairs, elliptic-oblong, 3.8–6.3 cm long. Flowers bright yellow, borne in large, conspicuous,

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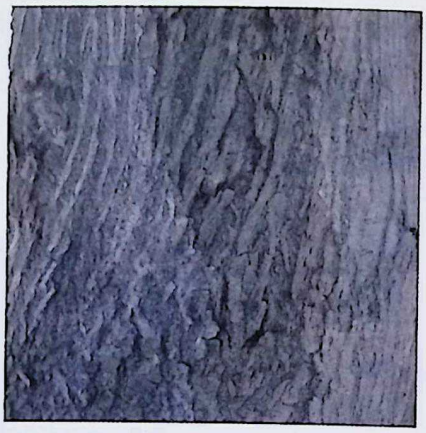

erect, axillary and terminal panicles up to 60 cm long. Fruits (pods) slightly curved at the posterior end, flattened, soft, ribbon-like when young, purple or brown when ripe, 15–30 cm long and 1–3 cm wide, many-seeded; seeds shiny, brown. Flowers mainly between September and November and fruits from February to April in central India.

Distribution and habitat

Native to southern India and Myanmar (Burma) to Sri Lanka, Indochina, Thailand and perhaps also peninsular Malaysia and Sumatra, but planted throughout the tropics. In southern India, it is found in the deciduous mixed forests of Tamilnadu, typically along riverbanks and along roadsides. Extensively planted as a shade tree, an ornamental and for reforestation of degraded sites throughout the tropical moist forest zones of the country to an elevation of about 1200 m, growing best in areas receiving a minimum annual rainfall of 1000 mm.

Medicinal properties and uses

The roots are used to treat intestinal worms, and for preventing convulsions in children. The leaves possess purgative properties. The flowers are sometimes eaten in curries.

References

Chopra *et al.* (1956, 1969), CSIR (1948–1992).

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Cassia tora L.

Botanical synonym

Senna tora (L.) Roxb.

Common names

Bengali: chakunda, panevar; ***English***: fetid cassia, sickle senna, wild senna; ***Gujarati***: kawario, kovariya, kuvadio, kuwadiyo, ponvadio; ***Hindi***: chakavat, chakunda, chekour, chkoda arak, panevar, puar, tarata, torta; ***Kannada***: chogache, gandutogache, taragasi, vanavarike; ***Malayalam***: chakramandarakam, takara; ***Marathi***: takala, takla, tankli, tarota; ***Oriya***: chakunda; ***Sanskrit***: cakramarda, cakramardah, chakramarda, chakramardah; ***Tamil***: senavu, tagarai, usittagarai, vanamavaram, vindu; ***Telegu***: chinnakasinda, tantemu, tellakasinda.

Description

A fetid, annual herb or undershrub, usually 0.3–1 m tall with glabrous branches. Leaves 6–12.5 cm long; stipules linear-subulate, somewhat falcate, 10–15 mm long; leaflets in 2–4 opposite pairs with a conical gland between each of the two lowest pairs of leaflets, leaflet blades 1.5–5 cm long and 1.5–2.5 cm wide, membranous, ovate-oblong, apex acute to subacute, often mucronate, base acute to asymmetrically rounded. Flowers usually in pairs, on very short axillary peduncles; calyx divided to the base, segments 5 mm long, ovate, acute, spreading; petals 5, pale yellow, subequal, *c.* 8 mm long and 2.5 mm wide, oblong, obtuse, spreading, the upper petal (standard) 2-lobed, the others entire. Fruits (pods) stout, 4-angled, 15–25 cm long, containing 25–30 green seeds. *Cassia tora* can be distinguished from the very similar *C. obtusifolia* by the presence of a gland between the last two pairs of leaflets; in the latter, this gland is found between only one pair of leaflets. Flowers and fruits throughout the year, depending on locality, but mainly between July and December.

Distribution and habitat

A common pantropical weed found throughout India to an elevation of *c.* 1500 m in the Himalayas, often gregarious, typically on roadsides, grazing lands and waste places.

Medicinal properties and uses

The mature leaves possess purgative properties and are used as an antiperiodic and anthelmintic; in the form of a decoction they are used as a laxative. They are extremely useful for curing ringworm and other skin diseases; a paste of the leaves is used as an external application to treat measles among the tribal inhabitants of Prakasam District in southern Andhra Pradesh. The pounded leaves are applied as a poultice on cuts and wounds to promote healing, and in Ayurveda for treating gout, sciatica and joint pains. The leaves are also used for the treatment of cough and impetigo. Pounded with egg-white, they are applied as a plaster to help heal

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bone fractures. The seeds are used for treating eye diseases, liver ailments and earache; in Ayurvedic practice they are recommended for treating arthritis and hemicrania. Among the Kondhs in south-western Orissa, the seeds are made into a paste with turmeric root (*Curcuma longa*: *Zingiberaceae*) and applied as a poultice to relieve gonorrhoea. The filtrate of the boiled, powdered seeds is considered a blood-purifier and is given to relieve skin inflammation. Among the rural inhabitants of Bhavnagar District in Gujarat, a paste prepared from the seeds is used externally to treat ringworm. The roots reportedly possess bitter, tonic, purgative and anthelmintic properties. A paste of either the root or the pulverized seeds with lime juice is used to treat ringworm and other skin diseases. The young and tender leaves and stems and unripe pods are eaten as a vegetable and in soups. The powdered, roasted seeds can be used as substitute for coffee.

References

Asolkar *et al.* (1992), Bhatt *et al.* (1999), Chatterjee and Pakrashi (1992), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Girach (1992), Kirtikar *et al.* (1935), Sivarajan and Balachandran (1994), Vijaya Kumar and Pullaiah (1998), Yoganarasimhan (1996).

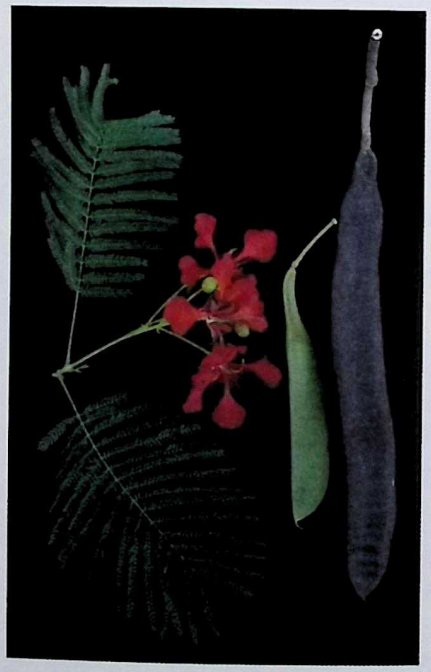
Delonix regia (Bojer) Raf.

Botanical synonym

Poinciana regia Bojer ex Hook.

Common names

Bengali: radha chura; ***English***: flamboyant tree, royal poinciana; ***Hindi***: gulimohur, gulmohur, gultora; ***Kannada***: doddartna-grandhi, kattikayi; ***Malayalam***: alasippu; ***Marathi***: gulmohr; ***Tamil***: mayarum, mayirkonrai, panjadi; ***Telegu***: erraturayl, peddaturayi, shimasankesula, shima-sumkesula.



Description

A medium-sized tree with a buttressed trunk, smoothish grey-brown bark, and a spreading crown of feathery foliage. Leaves alternate, bipinnate, 20–50 cm long; pinnae 10–25 pairs, 5–12 cm long, each with 12–40 pairs of leaflets; leaflets 0.5–1 cm long and 0.3 cm wide, very thin, rounded at the base and apex, very minutely hairy on both surfaces. Flowers are borne in broad, lateral clusters (racemes), individual flowers *c.* 10 cm across, on slender stalks 5–7 cm long, crimson-red to scarlet-orange in colour. Fruits (pods) are hard, 35–50 cm long and about 5 cm wide, splitting into two parts, containing numerous mottled brown seeds, 2 cm long and 0.6 cm wide. In central Indian deciduous forest areas, it flowers between April and June, when trees are leafless.

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Distribution and habitat

Native to Madagascar, cultivated as an ornamental in tropical countries worldwide. In India it is planted along roads and in gardens throughout the warmer parts of the country.

Medicinal properties and uses

In Siddha, the leaves are reportedly used to treat constipation, inflammations, arthritis and hemiplagia.

References

Asolkar *et al.* (1992), CSIR (1948–1992), Nadkarni (1954), Yoganarasimhan (1996).

Peltophorum pterocarpum (DC.) Backer ex K. Heyne

Botanical synonyms

Caesalpinia gleniei Thwaites, *C. inermis* Roxb., *Inga pterocarpa* DC., *Peltophorum ferrugineum* (Decne.) Benth., *P. inerme* (Roxb.) Llanos, *P. roxburghii* (G. Don) Degener, *Poiciana roxburghii* G. Don

Common names

English: yellow gold mohur, rusty shield-bearer; ***Tamil***: ivalvagai, ivavakai, perugondrai; ***Telegu***: kondachinta.

Description

A handsome tree up to 24 m tall, with a dense, spreading crown and smooth, grey bark; young stems brown tomentulose. Leaves bipinnate with 4–14 pairs of pinnae, each with 10–15 pairs of leaflets; leaflets deep green, oblong, 1–2 cm long and 0.3–1 cm wide, obtuse to retuse at apex, asymmetrically acute and rounded at base; stipules small, unbranched. Flowers fragrant, yellow, borne in large, erect, terminal panicles on pedicels 0.7–1 cm long; calyx lobes acute, 7–10 mm long, petals bright yellow, about 1.7–2.5 cm long. Pod flat, winged, oblong-elliptic, 5–10 cm long and 1.7–2.8 cm wide, reddish-brown, containing 1–5 oblong, flattened, brownish seeds.

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Distribution and habitat

Native to Sri Lanka and the Andaman Islands; cultivated in India, Malaysia and northern Australia for its ornamental value.

Medicinal properties and uses

Although not used traditionally in India, the bark is used medicinally in Java for the treatment of dysentery and externally in lotions to relieve eye troubles, muscular pains and sores

References

CSIR (1948–1992), Nadkarni (1954), Yoganarasimhan (1996).

Saraca asoca (Roxb.) DeWilde

Botanical synonym

Jonesia asoca Roxb., *J. pinnata* Willd., *Saraca indica* auct. non L.

Common names

Bengali: asok, asoka, ashoka, debdaru; ***English***: ashoka tree; ***Gujarati***: ashok, ashopalava, asupala; ***Hindi***: ashok, ashoka, asok, sita asok; ***Kannada***: akshath, ashanke, ashoka, ashuge, ashokam, kenkali; ***Konkani***: assoc; ***Malayalam***: asokam, hemapushpam, vanjulam; ***Marathi***: ashoka, jasundi; ***Oriya***: asoko, oshoko; ***Punjabi***: asok; ***Sanskrit***: ashoka, ashokam, asoka, asokah; ***Tamil***: anagam, asogam, asogu, asoka, malaikkarunai, sasubam; ***Telegu***: asoka, asokamu, kankeli, vanjulamu.

Description

A small, evergreen tree up to 9 m tall with glabrous branches; bark dark brown to grey or almost black, warty. Leaves 15–25 cm long, rachis glabrous, corky at base; petioles very short, stipules between petioles, 1–1.3 cm long and 6 mm wide, ovate-oblong, obtuse, parallel-veined; leaflets 4–6 pairs, oblong-lanceolate, 4–25 cm long and 1–9 cm wide, rigidly subcoriaceous, apex acute to acuminate, base acute to rounded; petiolules 4.5–6.5 mm long, stout, wrinkled, stipels small, deciduous. Flowers orange or orange-yellow, turning vermilion, very fragrant, in dense axillary and terminal corymbose panicles 7.5–10 cm across; pedicels 8–13 mm long, red, glabrous; bracts ovate, subacute; bracteoles 2, calyx-like, 4 mm long, spathulate-oblong, ciliolate, amplexicaul; calyx yellow turning orange and finally red, tube 1.3–2 cm long, cylindrical, segments 4, oblong or obovate-oblong, 1 cm long; petals absent. Pods flat,

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leathery, 10–25 cm long and 3.5–5 cm wide, containing 4–8 compressed, ellipsoid-oblong seeds. Flowers in March–April and fruits in August–September.

Distribution and habitat

Native to India, Sri Lanka, Bangladesh and Myanmar (Burma). Found under natural conditions in the central and eastern Himalayan foothills and in western peninsular India to an altitude of 750 m, generally along streams and in the shaded understorey of evergreen forests; more common in south India than in other parts of the country. It is becoming rare throughout its range, more often encountered as a planted ornamental and avenue tree than in natural forests.

Medicinal properties and uses

Saraca asoca is one of the most sacred trees of the Hindus and Buddhists; Gautama Buddha is said to have been born beneath an ashoka tree. It is considered as a symbol of love and believed to be capable of relieving the sorrows of people. The astringent bark is reported to have a stimulating effect on the endometrium and ovarian tissue, and is useful for treating menstrual pain and menorrhagia due to uterine fibroids, leucorrhoea, and internal bleeding, haemorrhoids and haemorrhagic dysentery. In Ayurvedic medicine, it is also used for treating dyspepsia, diseases of the

blood, biliousness, tumours, abdominal enlargement, colic, piles, ulcers and bone fractures. In Siddha, it is used to treat menorrhagia, diarrhoea and bleeding piles. Leaves possess blood-purifying properties and their juice, mixed with cumin seeds, is used for stomach-ache. The flowers, pounded in water, are used to treat haemorrhagic dysentery and the dried flowers for diabetes; they are considered to be an excellent uterine tonic, and useful for the treatment of syphilis and biliousness. The edible seeds are diuretic. Its flowers are used for religious ceremonies and temple decorations.

References

Chatterjee and Pakrashi (1992), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935), Sivarajan and Balachandran (1994), Yoganarasimhan (1996).

Tamarindus indica L.

Botanical synonym

Tamarindus occidentalis Gaertn., *T. officinalis* Hook.

Common names

Bengali: ambli, amli, tentul, tinturi; ***English***: Indian date, tamarind tree; ***Gujarati***: amali, ambali, ambli, amli; ***Hindi***: ambli, amli, imli, nuli, tamrulhindi; ***Kannada***: amla, amli, huli, hunase, hunise; ***Konkani***: chinch; ***Malayalam***: amlam, puli, valampuli; ***Marathi***: amli, chicha, chinch; ***Oriya***: konya, koya, omlika, tenthuli, tentuli, tetul; ***Punjabi***: imli; ***Sanskrit***: amlika, cinca, tintili; ***Tamil***: amilam, amiligai, eginam, kinjam, puli, puliamaram, tindiram; ***Telegu***: amlika, chinta, chintachettu, chintapandu (fruit), sintachettu; ***Urdu***: imli.

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Description

A medium-sized to large evergreen tree, up to 24 m tall, with a short, thick trunk and dense, spreading crown of feathery foliage; bark horizontally and longitudinally fissured, dark grey or brownish. Leaves alternate, paripinnate, up to 15 cm long; leaflets generally 10–20 pairs closely set on the rachis, subsessile, oblong-elliptic, 0.8–3 cm long and 0.5–0.8 cm wide, glabrous, rounded to truncate or retuse at apex, rounded at base. Flowers small, yellow with pinkish stripes borne in lax, few-flowered racemes at the end of branchlets. Fruits (pods) irregularly constricted between the seeds, slightly curved, pale brown, indehiscent, up to 20 cm long and 2.5 cm wide; seeds 3–12, obovate-oblong, compressed, with a shallow oblong pit on each side of the flat faces, about 1.6 cm long and up to 1 cm thick, smooth, lustrous, dark brown, set in a fibrous, reddish to brown, sweetish, acidic, edible pulp. Flowering usually occurs in synchrony with new leaf growth, in most localities of central India from February to April; fruits ripen during the winter, from November onwards.

Distribution and habitat

Native to Africa from Senegal to Ethiopia, Kenya and Tanzania, and cultivated throughout the tropics and subtropics for its edible fruit pulp; often naturalized. In India, it is cultivated and naturalized throughout the country in the plains and sub-Himalayan foothills, and particularly in the south.

Medicinal properties and uses

The fruit pulp is much used in traditional Indian medicine as a refrigerant, digestive, carminative and laxative; it is commonly prescribed for febrile diseases and bilious disorders, usually adminstered as an infusion. The infusion is also used as a gargle to relieve sore throat. The pulp is also reported to possess antiseptic properties and is recommended for external application as a poultice to relieve inflammatory swellings and boils; a poultice of the fresh leaves is also used for this purpose. An infusion of the leaves is said to be cooling and useful in treating bilious fever. The expressed leaf juice is reportedly used internally for treating bleeding piles and dysuria. A decoction of the leaves is taken

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internally to relieve body-ache by the Kondhs of southwestern Orissa. In southern Orissa a paste of the tender leaves and a powder made from the dried flowers mixed with sugar, is taken to treat dysentery. A poultice of the flowers is used to treat inflammations of the conjunctiva. The seeds, particularly the testae, are astringent and considered useful for treating diarrhoea and dysentery. Pounded with water, they are reportedly applied to the crown of the head for relief of cough and to relax the uvula. A poultice of the boiled seeds is applied to promote healing of boils. Among the tribal inhabitants of Surguja District in northeastern Madhya Pradesh, a decoction of the seeds is used as an external application to remove facial blemishes. The seed kernel is used as a mild purgative and stimulant. The stem bark is antipyretic and astringent and is given to treat diarrhoea; in lotions and poultices, it is also applied to sores and boils.

References

Chatterjee and Pakrashi (1992), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Girach (1992), Kirtikar *et al.* (1935), Kumar and Jain (1998), Mohanty *et al.* (1996), Sivarajan and Balachandran (1994), Yoganarasimhan (1996).

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Fabaceae-Mimosoideae

Acacia catechu (L. f.) Willd.

Botanical synonym

Mimosa catechu L. f.

Common names

Bengali: khayar, kuth; ***English***: black catechu, cutch tree; ***Gujarati***: kher, kherio, kherio-baval; ***Hindi***: alagjaie, katha, khair, khair-babul, khaivar, khayer, sandramand; ***Kannada***: kachu, kag, kaggali, kanti, kugli; ***Malayalam***: khadiram; ***Marathi***: kaderi, khaderi, khair, lalkhair; ***Oriya***: bimbu, khodiro, khoiru; ***Punjabi***: khair; ***Sanskrit***: balapatra, dantadhavan, gayatri, khadira, khadirah; ***Tamil***: baga, kadiram, karangalli, othalei; ***Telegu***: kachu, khadiramu, sandra.

Description

A small to medium-sized, deciduous tree with a light feathery crown, usually up to 12 m tall; bark dark greyish-brown, rough, exfoliating in long, narrow strips; young shoots dark brown or purple. Leaves bipinnate, 10–15 cm long, rachis pubescent with glands between many of the pairs of pinnae and a large gland at or near the middle of the petiole and a pair of recurved prickles at the base; pinnae 10–30 pairs, 3.8–5 cm long; leaflets 30–50 pairs per pinna, linear, 4.5–6 mm long and 1.2 mm wide, linear, sessile, often ciliate. Flowers sessile, pale yellow in cylindrical, axillary spikes 5–10 cm long; calyx campanulate, 1.2–1.5 mm long, hairy outside; corolla 2–3 times as long as the calyx, lobes ovate-oblong, subacute, pubescent. Fruits (pods) stalked, 5–7.5 cm long and 1–1.6 cm wide, flat, thin, brown, shining, with a triangular beak at the apex and narrowed at the base into a 3–6-mm-long stalk; dehiscent when mature. Flowers between June and August, and pods ripen between December and February.

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Distribution and habitat

Found in dry forest regions throughout India, Pakistan and Myanmar (Burma) on a variety of soil types in areas receiving between 500 and 2000 mm annual rainfall, up to 1200 m elevation in northern India. Most common in central India, where it occurs in open grasslands and in teak forests in Madhya Pradesh, and in dry open thorn forests in Maharashtra and Gujarat; often gregarious on dry, shallow, rocky soils. In Tamilnadu, Bihar and Rajasthan it occurs in mixed deciduous forests. It is commonly associated with *Acacia leucophloea*, *Albizia odoratissima*, *Anogeissus latifolia*, *Buchanania lanzan*, *Diospyros melanoxylon*, *Lagerstroemia parviflora*, *Terminalia chebula* and *T. tomentosa*.

Medicinal properties and uses

The most important commercial product obtained from this species is *catechu*, a crystalline substance extracted from the heartwood of 20–30-year-old trees. It is marketed in two forms: *katha* (pale catechu) which is used in medicine and in *pan* preparations; and *cutch* (dark catechu) which is used for printing and dyeing purposes. In Ayurvedic medicine, both the astringent bark and heartwood are used in the treatment of leprosy, pruritis, wounds, bronchial asthma, distaste and stomatitis. The bark is used to treat passive diarrhoea, either alone or in combination with cinnamon or opium; its decoction is taken internally to treat leprosy. *Katha* has long been used in Indian medicine as an ingredient in a number of compound preparations. It is considered astringent, cooling and digestive, and is used to treat cough and diarrhoea. It is used externally as an astringent and styptic as a lotion to relieve boils, ulcers and skin eruptions.

References

Asolkar *et al.* (1992), Chatterjee and Pakrashi (1992), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Joshi (1989), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

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Acacia chundra Willd.

Botanical synonyms

Acacia catechu auct. non Willd., *A. catechu* Willd. var. *sundra* Prain., *A. sundra* (Roxb.) DC., *Mimosa chundra* Roxb. ex Rottl., *M. sundra* Roxb.

Common names

English: red kutch (trade); ***Kannada***: kachu, kaggli, kempu jali, kempu kagli; ***Malayalam***: kannali; ***Marathi***: lal khair; ***Sanskrit***: khadira; ***Tamil***: karamgali, karangali, karugali; ***Telegu***: sandra, sardra, sundra.

Description

A small tree up to 8 m tall, with smooth, glabrous branches and pale, purplish-brown branchlets; bark dark brown, peeling off profusely. Leaves 10–15 cm long, bipinnate with recurved stipular spines 0.3 cm long on a broad base; petiole gland at the base of first pair of pinnae; pinnae 10–20 pairs, 2.5–3.5 cm long; leaflets 30–40 pairs, oblong, to 4 cm long and 1 cm wide. Flowers yellowish-white in axillary spikes 6–8 cm long. Fruits (pods) stalked, thin, flat, glabrous, 6 cm long, 3–4-seeded. In Karnataka, flowers April–September; fruits August–January.

Distribution and habitat

Native to peninsular India and Myanmar (Burma); found in scrub forests of western and southern India in the states of Rajasthan, Gujarat, Maharashtra, Karnataka, Andhra Pradesh and Tamilnadu on dry, rocky soils.

Medicinal properties and uses

The stem bark is astringent and is applied to boils and ulcers as an antiseptic. A paste prepared from the bark and leaves is used externally to relieve abscesses.

References

Asolkar *et al.* (1992), CSIR (1948–1992).

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Acacia farnesiana (L.) Willd.

Botanical synonyms

Mimosa farnesiana L., *Vachellia farnesiana* (L.) Wight & Arn.

Common names

Bengali: gaya babul, guva babul, guye babul; ***English***: cassie flower, fragrant acacia; ***Gujarati***: gandhelo babul, jheri baval, talbaval; ***Hindi***: deibabul, ghand babul, passi-babul, vilayati babul, vilayati kikar; ***Kannada***: jali, kasturigobbali, kasturijali, kirijali, sannajali; ***Malayalam***: arivelam, pivelam; ***Marathi***: devabhabul, gubabul, kankar, kankri; ***Oriya***: gudoyaboburo, gongghoguanria, kapur; ***Sanskrit***: arimeda, arimedah, gabur, irimeda; ***Tamil***: kadivel, kasturivel, veddavala; ***Telegu***: kasturi, kasturitumma, murki-tumma, oda sale, piktumi.

Description

A thorny bush or small tree reaching a height of 4.5 m with slender, zig-zag branches marked with grey or pale brown dots. Leaves bipinnate, 2.5–5 cm long, with straight, stipular spines usually 4–8 mm long; main rachis more or less pubescent; petiole usually with a minute gland near the middle; pinnae 4–8 pairs, 2–2.5 cm long; leaflets 10–20 pairs, 4.5–6 mm long and 1.2–1.5 mm wide, rigidly coriaceous, linear-oblong, acute, green, base oblique, rounded. Flowers bright yellow to orange, fragrant, in axillary globose heads 0.6–1.3 cm across, peduncles 2–4 cm long; calyx 1.5 mm long, membranous, teeth short, triangular, acute; corolla 2.5 mm long, lobes very short, acute. Fruits (pods) subcylindrical, 5–9 cm long and 1–1.3 cm broad, slightly curved, conspicuously veined, dehiscent, dull brown; seeds 4–6 per pod, embedded in a pulpy mesocarp. Flowers from November to March, and fruits from February to June in central India.

Distribution and habitat

Apparently native to the northern Mediterranean coast, introduced and naturalized throughout the tropics. In India it occurs, often gregariously, in loose, sandy soils of riverbeds throughout the country; often cultivated in gardens.

Medicinal properties and uses

In Ayurvedic practice, the bark and heartwood are used as substitutes for those of *Acacia catechu,* in the treatment of leprosy, pruritis, wounds, bronchial asthma, distaste and stomatitis. The bark is considered alexiteric, anthelmintic and antidysenteric, and the gum is tonic and aphrodisiac. The tender leaves, bruised in a little water, are prescribed for gonorrhoea. The acrid, astringent bark is used in the form of a decoction for treating polyuria. The flowers are the source of the highly valued *cassie* perfume.

References

Asolkar *et al.* (1992), Chatterjee and Pakrashi (1992), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

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Acacia ferruginea DC.

Botanical synonym

Mimosa ferruginea Roxb.

Common names

Gujarati: kaigu, kanti, khaiger; ***Hindi***: brahmani khair, khair bora, son khair; ***Kannada***: banni; ***Konkani***: ker; ***Malayalam***: vanni; ***Marathi***: kat-khair, pandhra khair, phandra khair; ***Oriya***: kanta chira; ***Sanskrit***: somasara; ***Tamil***: karmbai, parambai, peykkarungali, simaivellel, vanni, velvel, velvelam; ***Telegu***: ansandra, vannesandra, vellisandra, tellatumma.

Description

A small to medium-sized deciduous tree up to 10 m tall, with rough, rusty bark and glabrous branchlets usually armed with prickles. Leaves bipinnate, 5–11 cm long; main rachis slender, glabrous, with a large gland near the petiole and another between the uppermost pair of pinnae; petioles 2.5–5 cm long, thickened at the base; stipular spines short, hooked, in pairs; pinnae 3–6 pairs, 5–7.5 cm long, shortly stalked, the stalks thickened at the base; leaflets 10–20 pairs, 6–12 mm long and 2–3 mm wide, linear-oblong, obtuse, unequal-sided, glaucous above, paler beneath, rigidly subcoriaceous, glabrous. Flowers pale yellow, sessile, borne in dense, axillary spikes 7.5–14 cm long or in panicles at the ends of branches; peduncles often numerous; calyx campanulate, 1.5 mm long, glabrous; corolla 3–4 mm long, divided about half way down, lobes oblong-lanceolate, acute. Fruits (pods) stalked, 7.5–12.5 cm long and 2–2.5 cm wide, straight, flat, thin, brown, reticulately veined, glabrous, indehiscent, the upper suture narrowly winged; seeds 4–8. In Karnataka, flowers and fruits from February to June; in central India flowering occurs in January and February and fruits mature in November and December.

Distribution and habitat

Found scattered in dry thorn or scrub forests of western and southern India from Gujarat and Madhya Pradesh through Maharashtra, Andhra Pradesh, Karnataka and Tamilnadu to the eastern slopes of the Western Ghats.

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Medicinal properties and uses

In Ayurveda the astringent bark is considered useful for treating itching, leucoderma, ulcers, stomatitis and diseases of the blood. In Unani medicine the extract of the leaves is considered astringent, styptic and tonic; it is used to stop suppuration, to enrich the blood, and in the treatment of eye diseases, diarrhoea, dysentery, gonorrhoea, gleet, burns and scalds, and is thought to be beneficial to the alimentary and urinary tracts. The gum exuded from the cut bark possesses demulcent and emollient properties.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

Acacia leucophloea (Roxb.) Willd.

Botanical synonym

Acacia alba Willd., *Mimosa alba* Rottler, *M. leucophloea* Roxb.

Common names

Bengali: safed babul; ***English***: white babul, white-barked acacia; ***Gujarati***: haribaval, himvaro, pilobaval, rambavala; ***Hindi***: nimbar, reung, reunjha, safed babul, safed kikar; ***Kannada***: bela bellada, bilajali, nayibela, toppalu; ***Konkani***: uevar; ***Malayalam***: pattacharya maram, vellavelakam, vellavelam; ***Marathi***: hewar, hiwa, hiwar, panharva; ***Oriya***: gohira, goira, guanria, gwaria; ***Punjabi***: raeru, reru, safedkidar; ***Sanskrit***: arimeda, arimedah, irimeda, shvetabarbura, vrikshala; ***Tamil***: pattaicharayam, sarai, tellathuma, velvayalam, velvelam; ***Telegu***: harwar, tellathuma, tellatumma.

Description

A small to medium-sized, deciduous tree up to 10 m tall; branches dense, spreading, the young ones pubescent; bark light yellowish-brown to nearly white outside and light red inside, smooth, exfoliating in irregular scales. Leaves bipinnate, 2.5–6 cm long, main rachis pubescent, usually with a cup-like gland between each pair of pinnae; stipular spines straight, paired; pinnae 5–15 pairs, 2–3.8 cm long; leaflets 12–30 pairs, 3–6 mm long, linear-oblong, obtuse, ciliate along the margins. Flowers yellow, borne in globose heads 6–9 mm in diameter arranged in terminal panicles about 30 cm long; pedicels stout, downy, with a toothed ring of bracts above the middle; calyx *c.* 1.2 mm long, teeth short; corolla *c.* 2.5 mm long,

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lobes subacute. Fruits (pods) 10–20 cm long and 6–8 mm wide, sessile, thin, flat, slightly curved, clothed with pale brown tomentum, containing 10–20 seeds. In central India flowering occurs mainly between August and October and fruiting from December to April; trees remain leafless between March–April and May–June.

Distribution and habitat

Native to South and Southeast Asia from Pakistan, India and Sri Lanka eastwards to Indochina, Malaysia and Indonesia. Found in savannah or scrub vegetation and dry deciduous forests on well-drained soils at low elevations from Punjab to Bihar southwards to Tamilnadu; particularly common on black cotton soils in central India.

Medicinal properties and uses

In Ayurveda the stem bark is considered acrid, cooling, alexiteric, anthelmintic, astringent and antipyretic; it is used to treat inflammation, bronchitis, biliousness and leprosy. It is reportedly used externally as an abortifacient among the Kathodias of Rajasthan. The powdered stem bark is used as a tooth powder to relieve severe toothache among the tribal inhabitants of southern Andhra Pradesh. The gum exuded from the cut bark is demulcent and used as an emulsifying agent. The young pods and seeds are edible.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Joshi (1989), Kirtikar *et al.* (1935), Rao *et al.* (1996), Yoganarasimhan (1996).

Acacia nilotica (L.) Willd. ex Delile subsp. *indica* (Benth.) Brenan

Botanical synonyms

Acacia arabica (Lam.) Willd. var. *indica* Benth., *A. arabica* sensu Baker, *A. nilotica* (L.) Delile, *A. nilotica* var. *indica* (Benth.) A.F. Hill, *A. vera* Willd., *Mimosa arabica* Lam., *M. nilotica* L.

Common names

Bengali: babla, babul, kikar; ***English***: Indian gum arabic tree; ***Gujarati***: babalia, bamura, baval, bawal; ***Hindi***: babul, babur, kikar; ***Kannada***: babbuli, gobbali, jali, kari gobli, kari jali ; ***Konkani***: babul; ***Malayalam***: karivelam, karuvelakam, karuvelam; ***Marathi***: babhul, babli, babul, vedibabul; ***Oriya***: babulo, bambuda, baubra; ***Punjabi***: babla, babul, babur, kikar; ***Sanskrit***: babbula, babula, barbara, kinkirata, sukshmapatra, yugmakanta; ***Tamil***: karuvai, karuvelam, karu velamaram, karuvelei; ***Telegu***: nallatumma, nellatuma, tumma; ***Urdu***: babul.

Description

A small to medium-sized, almost evergreen tree with a short trunk, a spreading crown and feathery foliage, generally attaining a height of up to 15 m; bark dark brown to almost black, longitudinally fissured or

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deeply cracked. Leaves bipinnate, 2.5–5 cm long, with spinescent stipules; petioles 2.5–5 cm long; pinnae 4–9 pairs, 2–5 cm long; leaflets 10–25 pairs, 3–6 mm long and 1.2–2 mm wide, linear-oblong. Flowers golden-yellow, fragrant, crowded in long-stalked globose heads 1.5 cm in diameter, forming axillary clusters of 2–5 heads; calyx campanulate, 1.2 mm long, teeth very short; corolla 3 mm long, lobes short, triangular. Fruits (pods) stalked, 7.5–15 cm long and 1.3–1.6 cm wide, constricted between the circular seeds, densely and persistently grey downy; seeds 6–12. Flowering occurs generally during the rainy season, occasionally to December; fruiting usually from April to June. Three varieties of *A. nilotica* are recognized in India: (1) var. *cupressiformis* Stewart, characterized by its broom-like ascending branches; (2) var. *vediana* Cooke, a smaller variety with rough, fissured bark; and (3) var. *indica*, the most common variety found in natural and plantation forests.

Distribution and habitat

Apparently native to Egypt, the Arabian peninsula and India; cultivated and naturalized in many tropical and subtropical countries. It is a very common species in dry to moist inland habitats nearly throughout India from Punjab to West Bengal southwards, where it often forms pure stands or is dominant in mixed stands. It is usually confined to low elevation sites on flat or gently undulating terrain and ravines, though is occasionally found on sites up to 900 m elevation. Its common associates include *Acacia leucophloea*, *Prosopis cineraria*, *Azadirachta indica*, *Ziziphus jujuba* and *Cassia auriculata*.

Medicinal properties and uses

In Ayurveda the bark is considered astringent to the bowels, alexipharmic and anthelmintic; it is used to treat coughs, bronchitis, diarrhoea, dysentery, biliousness, piles, leucoderma and urinary discharges. A decoction of the bark is used as a gargle to relieve sore throat and toothache. The leaves are considered useful for treating bronchitis, piles, eye diseases and to promote healing of bone fractures; in Unani medicine they are used as a liver and brain tonic, antipyretic, and for treating leucoderma, gonorrhoea, strangury and ophthalmia. The gum exuded from the cut bark (*babul gum*) is used as a substitute for true gum arabic as an astringent and styptic. It is used in Ayurvedic practice to treat biliousness, leprosy, urinary, vaginal and uterine discharges, and in Unani medicine as an antipyretic, liver tonic and for treating sore throat, cough, piles, burns and colic. Among the Irulars of Tamilnadu the powdered gum is mixed with egg-white and applied externally to relieve scalds and

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burns. A decoction of the pods is used in the treatment of urinogenital diseases. An infusion or the pulp of the tender leaves mixed with rice water is used as an astringent and remedy for diarrhoea and dysentery. The twigs are used as toothbrushes in some locales. The tannin-rich bark is highly valued for tanning, particularly in northern India. A decoction of the bark is used as a substitute for soap, and the unripe pods are sometimes used to make ink.

References

Asolkar *et al.* (1992), Bhatt and Mitaliya (1999), Chatterjee and Pakrashi (1992), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Mohanty *et al.* (1996), Ragupathy and Mahadevan (1991), Yoganarasimhan (1996).

Acacia pennata (L.) Willd.

Botanical synonyms

Acacia pluricapitata Steud., *A. polycephala* Graham, *A. tomentella* Zippel ex Spanoghe, *Mimosa pennata* L., *M. torta* Roxb.

Common names

Bengali: kuchui; ***English***: rusty mimosa; ***Gujarati***: kherval; ***Hindi***: aila, biswul; ***Kannada***: kadusige, mullusige, sige; ***Malayalam***: kareencha, kattusinikka, sunna; ***Marathi***: chilati, shembi, thembi; ***Oriya***: potadontari; ***Sanskrit***: ari, vallikhadira; ***Tamil***: indambudai, indamullu, indu, singaimullu; ***Telegu***: giddukorinda, karusikaya, mulukorinda.

Description

A large, thorny climbing shrub or rarely a small tree, armed with recurved, hooked, smooth prickles, 2–4 mm long on branchlets; branchlets and the undersides of leaf rachises densely light-brown pubescent. Leaves bipinnate, to 15 cm long, main rachis grooved, often prickly, with a large oval gland above the middle of the petiole and between each of the 2–4 upper pairs of pinnae; pinnae 8–18 pairs, 3.8–6.3 cm long, rachises densely pubescent; leaflets 30–60 pairs, 5–8 mm long and 0.8–1.2 mm wide, unequal-sided, mucronate at tip, base oblique, rounded or truncate, margins ciliate. Flower heads white or pale yellow, 1–1.3 cm in diameter, 1–3 together on

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10–15-cm-long peduncles in leaf axils, or combined into a large, loose terminal panicle up to 20 cm long; calyx glabrous, 2.5 mm long, lobes linear-lanceolate, acute. Fruits (pods) stalked, 10–20 cm long and 2–3 cm wide, straight, flat, thin, rounded or shortly apiculate, reddish-brown, glabrous, dehiscent, containing 6–12 round, flat seeds. Flowers between June and August in central and western India and fruits between January and April.

Distribution and habitat

A palaeotropical species distributed from India to Malesia, and in tropical and subtropical Africa. It is found throughout India in dry and moist deciduous forest areas to an altitude of 1500 m in the central and eastern Himalayas and on the eastern slopes of the Western Ghats. In central India it is very common along streams and ravines, and in hedges.

Medicinal properties and uses

In Ayurveda, the bark is used to treat diseases of the blood, biliousness, bronchitis and asthma. A decoction of the leaves is used as a febrifuge. The leaf juice, mixed with milk, is given to infants suffering from indigestion. The leaves are chewed, either alone or with sugar and cumin, to relieve bleeding gums. The fruit pulp is reportedly used as a piscicide (fish poison).

References

Asolkar *et al.* (1992), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Upadhye *et al.* (1994).

Acacia polyacantha Willd.

Botanical synonyms

Acacia suma Kurz, *Mimosa suma* Roxb.

Common names

Bengali: saikanta, sankanta, saukanta; ***English***: white kutch; ***Hindi***: chhikur; ***Kannada***: bannimara, bilejali, chelayudi, mugali, mugli; ***Malayalam***: venkarinnali; ***Marathi***: kamtiya; ***Oriya***: gonharea, guanria, somi, somiguanria; ***Sanskrit***: samee, samse, shami; ***Tamil***: kodil, kovil, mogali, selaivunjai, silai; ***Telegu***: saratumma, tellachandra, tellasundra.

Description

A medium-sized tree, with white-pubescent branches and whitish bark, exfoliating in papery flakes, and marked at intervals by darker horizontal patches. Leaves bipinnate, 10–15 cm long; main rachis pubescent, with a large conspicuous gland at or near the middle of the petiole and glands between upper 3–4 pairs of pinnae; petioles 2.5–3.2 cm long; stipular spines short, straight or slightly hooked from a broad triangular base; pinnae 10–30 pairs, 3.8–5.3 cm long, shortly stalked; leaflets 30–60 pairs, 5–6 mm long and 1.2 mm

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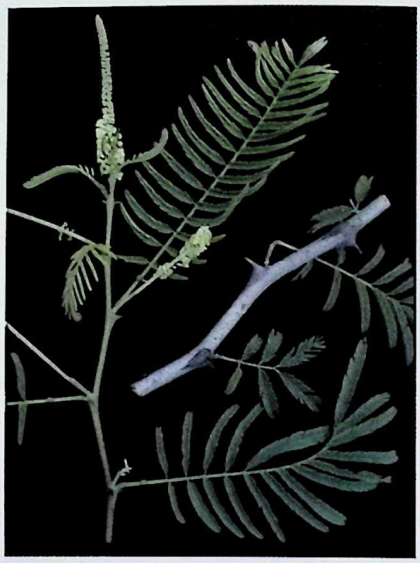
wide, linear, sessile, closely set on rachis and overlapping, apex obtuse, margins ciliate, rigidly coriaceous, pale green. Flowers sessile, pale yellow to nearly white in peduncled spikes 7.5–12 cm long; calyx campanulate, downy, 2 mm long, teeth short, deltoid, ciliate; corolla 2.5–3 mm long, divided about halfway down, lobes narrow-oblong, subacute. Fruit (pod) 7–15 cm long and 1.3–3.8 cm wide, flat, with a triangular beak at the apex, tapering at the base into a stalk 1.3–2 cm long, glabrous, reticulately veined, indehiscent, 6–8-seeded. In northern and central India, flowers during the rainy season and fruits in winter. In Karnataka, flowers from March to June; fruits from August to February.



Distribution and habitat

Found in moist localities in Bangladesh, West Bengal, Bihar and central India. In southern India it is more common in thorn scrub and the dry deciduous forests of Karnataka, Andhra Pradesh and Tamilnadu.

Medicinal properties and uses

The astringent bark and heartwood are used in Ayurveda as a substitute for *Acacia catechu* to treat leprosy, pruritis, wounds, bronchial asthma and stomatitis. A decoction of the ground bark is used as a gargle to relieve sore throat and toothache, and the dried, powdered bark is applied externally to promote healing of ulcers. An infusion of the tender leaves is used as an astringent and remedy for diarrhoea and dysentery. The pods are used in the treatment of urinogenital diseases. The seeds are reported to have a hypoglycaemic effect.

References

Asolkar *et al.* (1992), Chatterjee and Pakrashi (1992), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

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Acacia torta (Roxb.) Craib.

Botanical synonyms

Acacia pennata sensu Baker, *Mimosa torta* Roxb.

Common names

Hindi: aila; ***Kannada***: antarike; ***Malayalam***: anthochini, attu, incha, inna; ***Marathi***: chilar; ***Oriya***: dentari; ***Tamil***: kariyundu; ***Telegu***: tella korinda.

Description

A prickly climbing shrub or small tree. Leaves bipinnate, 10–15 cm long; main rachis with a conical petiole gland near the base and smaller glands between the upper 2–3 pairs of pinnae; pinnae 8–12 pairs, 5–7 cm long; leaflets 25–30 pairs, closely set but not overlapping, truncate at base, pubescent beneath, to 8 mm long and 2.7 mm wide. Flower yellowish-white to white, in paniculate heads *c.* 1 cm in diameter. Fruits (pods) 12 cm long and 2 cm wide, sometimes slightly wavy, glabrescent, containing 5–7 seeds. In Karnataka, flowers from March to August and fruits from August to March.

Distribution and habitat

Found in dry and moist deciduous forest zones throughout India to an altitude of 1200 m in the Himalayas.

Medicinal properties and uses

The plant is reportedly used in Ayurvedic for treatment of menstrual disorders. Various plant parts are reportedly used to treat tubercular fistula, measles, consumption, cough and bronchitis.

References

Asolkar *et al.* (1992), CSIR (1948–1992).

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Adenanthera pavonina L.

Botanical synonym

Adenanthera gersenii Scheffer.

Common names

Bengali: ratkachandan, raktakambal, ranjana; ***English***: circassian tree, coral wood, red bead tree, red wood; ***Gujarati***: badigumchi, barigumchi, hattigumchi, ratanjali; ***Hindi***: barighumchi, ratkachandana; ***Kannada***: doddagulaganji, manjadi, manjetti; ***Konkani***: odlygunji; ***Malayalam***: manchadi, maniadi, manjadi, manjati, sem; ***Marathi***: ratanjuni, thorlagunj, thorligunj; ***Oriya***: giridi, sokakainjo; ***Sanskrit***: kucandanah, kunchandana, kusandana; ***Tamil***: anaikundumani, anaikunrimani, anikundamani; ***Telegu***: bandi guruvenda, peddaguriginja.

Description

A deciduous, spreading, fast-growing, unarmed tree, usually 6–15 m tall, with dark brown to greyish-brown bark that is rough on old trees, and white or brownish inside. Leaves bipinnate, 20–30 cm long, spirally arranged on branchlets; petioles 5–10 cm long; pinnae 3–6 pairs, opposite, 7.5–15 cm long with a stalk 1.3–2 cm long; leaflets alternate, 4–8 pairs, 2.5–3.8 cm long and 0.8–2 cm wide, papery, elliptic-oblong, obtuse, glabrous, dark green above, glaucous beneath, base shortly cuneate, unequal-sided; petiolules 3 mm long. Flowers pale yellow, scented, in short-peduncled racemes 5–15 cm long, axillary or panicles at the ends of branchlets; pedicels 2.5–3 mm long, slender; calyx minute; corolla *c.* 3 mm long, segments united at the base only, linear-lanceolate, acute. Fruits (pods) narrow, 15–23 cm long and 1.6–2 cm wide, flat, falcately curved, pointed, the valves twisting spirally on dehiscence; seeds 8–15, globose, hard, shiny, usually bright scarlet, 8 mm in diameter. Flowers during the summer and fruits during winter.

Distribution and habitat

Native to Sri Lanka, southern Myanmar (Burma), Indochina, southern China, Thailand, Malaysia and Indonesia to the Solomon Islands. It is cultivated as a roadside and garden ornamental throughout India and in other tropical countries, often naturalized in evergreen to dry deciduous forest at lower elevations.

Medicinal properties and uses

The powdered seeds, sometimes mixed with honey, are used as an external appli-

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cation to hasten suppuration of boils and abscesses. A decoction of the seeds and wood is used to treat pulmonary affections, and as an external application for chronic ophthalmia. The roots are reported to be emetic. A decoction made from the leaves is used in south India as a remedy for chronic rheumatism and gout, and also to stop haemorrhage from bowels and for haematuria. The red dye obtained from the wood is used for colouring cloth, and for marking the forehead among Brahmins in India. The seeds are commonly used as ornaments (beads) and as jewellers' weights.

References

Asolkar *et al.* (1992), Chatterjee and Pakrashi (1992), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

Albizia amara (Roxb.) Boivin

Botanical synonyms

Acacia amara Willd., *A. wightii* Graham ex Wight & Arn., *Mimosa amara* Roxb., *M. pulchella* Roxb.

Common names

Bengali: krishnasirish; ***English***: oil-cake tree; ***Gujarati***: motosarsio; ***Kannada***: balukambi, chigare, chujjallu, sujjalu, tuggali, tugli; ***Malayalam***: chalavagai, oosulay, sulivaka, varacchi, varasi; ***Marathi***: lalai, lali, lulai; ***Sanskrit***: krishnasirish, krishnasirisha; ***Tamil***: suranji, turinjil, ushilai, unjai, wunja; ***Telegu***: chikreni, nallangi, nalla renga, sigara, sirikenu.

Description

A small to medium-sized, much-branched, deciduous tree, with a crooked bole, scaly, rather smooth, grey or greenish bark, and unarmed, densely yellowish-brown pubescent branchlets. Leaves bipinnate, 12 cm long; petiole gland below middle of petiole; rachis 4–11 cm long with a gland between upper pair of pinnae; pinnae 6–16 pairs, pubescent, 5 cm long; leaflets 10–30 pairs, sessile, ciliate along margins, to 7 mm long and 2 mm wide. Flowers white to yellow, fragrant, borne in axillary, peduncled, 12–20-flowered heads 2 cm across; calyx 1.7–2.5 mm long, funnel-

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shaped, pubescent; corolla about 3 times as long as the calyx, lobes linear-lanceolate. Fruits (pods) thin, brown, flat, faintly veined, pubescent, 10–20 cm long and 2–4 cm wide; seeds 6–8. In Karnataka, flowers from March to May, and fruits from June to January.

Distribution and habitat

Found throughout the drier regions of southern India up to 900 m elevation, and in a few localities in Madhya Pradesh, in scrub or dry deciduous forests. Occasionally grown as an avenue tree.

Medicinal properties and uses

The cut bark yields a gum which is cooling, and useful in the treatment of erysipelas, eye diseases, inflammation and ulcers. The leaves are used to treat conjunctivitis. The flowers are considered a cooling medicine and are applied externally to boils, skin eruptions and swellings. The seeds are astringent, and given in the treatment of piles, diarrhoea and gonorrhoea. The oil from the seeds is said to cure leprosy and leucoderma. The dried leaves are sometimes used as a soap substitute for washing hair.

References

Asolkar *et al.* (1992), Chatterjee and Pakrashi (1992), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

Albizia lebbeck (L.) Benth.

Botanical synonyms

Acacia lebbeck (L.) Willd., *A. sirissa* Hamilton, *A. speciosa* (Jacq.) Willd., *Albizia latifolia* Boivin, *Inga leucoxylon* Hassk., *Mimosa lebbeck* L., *M. serissa* Roxb.

Common names

Bengali: siris, sirish, sirisha; ***English***: East India walnut, lebbek, siris tree; ***Gujarati***: garso, pilosarasio, sarshio; ***Hindi***: siris, sirisha; ***Kannada***: baage, bagemara; ***Konkani***: garso; ***Malayalam***: kattuvaka, nenmani, vaga; ***Marathi***: chichola, sirisha; ***Oriya***: bodosirisi, katvaghe, konai, tinia, vagai; ***Punjabi***: sarin, shrin; ***Sanskrit***: bhandi, sirisa, sirisha; ***Tamil***: karuvagei, vagei; ***Telegu***: darshana, dirasana, pedda-duchirram, yirijapa; ***Urdu***: darash.

Description

A large, unarmed, deciduous tree to about 20 m tall with a spreading crown; bark pale; young shoots glabrous. Leaves bipinnate; rachis with a gland near the base of the petiole and one below uppermost pair of pinnae; pinnae usually 2–3 pairs, 7–12 cm long; leaflets 5–9 pairs, 2.5–4.5 cm long and 1.6–2 cm wide, with glands between their bases, elliptic-oblong or obovate-oblong (terminal leaflets), unequal-sided, retuse or

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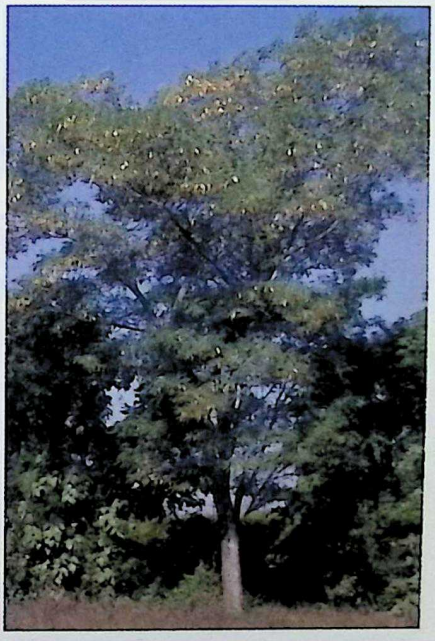

obtuse at apex, base obliquely rounded or truncate; petiolules very short. Flowers fragrant, white to greenish-yellow, borne in globose umbellate heads 2–3.8 cm in diameter; peduncles 3.8–7.5 cm long, solitary or 2–4 together from the axils of the upper leaves, pedicels 2.5–3 mm long; calyx 4 mm long, pubescent, teeth short, deltoid; corolla 1 cm long, tube glabrous, lobes 2.5 mm long, triangular, acute, pubescent outside; stamens much longer than the corolla. Fruits (pods) 10–30 cm long and 2–4.5 cm wide, linear-oblong, bluntly pointed, thin, green turning straw-coloured on maturity, reticulately veined above the seeds, smooth, shining; seeds 4–12, pale brown, ellipsoid-oblong, compressed. Flowers from April to June and fruits mature in December in northern and central India; in southern India flowering occurs earlier, from January to April. In central India trees remain leafless for a month or more between March and June.

Distribution and habitat

Probably native to tropical mainland Asia from Pakistan to Myanmar (Burma) but widely introduced as a garden or roadside ornamental and naturalized in many tropical and northern subtropical countries worldwide. It is common throughout India, from the plains up to 900 m elevation in the Himalayas.

Medicinal properties and uses

In Ayurveda the astringent root is used to treat hemicrania; the acrid bark is reportedly used to treat diseases of the blood, leucoderma, itching, skin diseases, piles, inflammation, erysipelas and bronchitis; the leaves are used to treat ophthalmia, and the flowers for asthma. In Unani medicine the root is used to treat ophthalmia; the bark is regarded as anthelmintic and used to relieve toothache and to strengthen the

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gums and teeth, and to treat leprosy, deafness, boils, scabies, syphilis and paralysis; the leaves are reportedly useful for treating night blindness; and the seeds are used to treat gonorrhoea and tuberculous glands, their oil applied locally for leucoderma. The flowers are used as a cooling medicine and as an external application to relieve boils, skin eruptions and swellings. The seed oil is used externally to promote healing of lesions in leprosy among the Irulars of Tamilnadu. The powdered root bark and root-gum are used as a dental powder for strengthening the gums.

References

Asolkar *et al.* (1992), Chatterjee and Pakrashi (1992), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935), Ragupathy and Mahadevan (1991), Yoganarasimhan (1996).

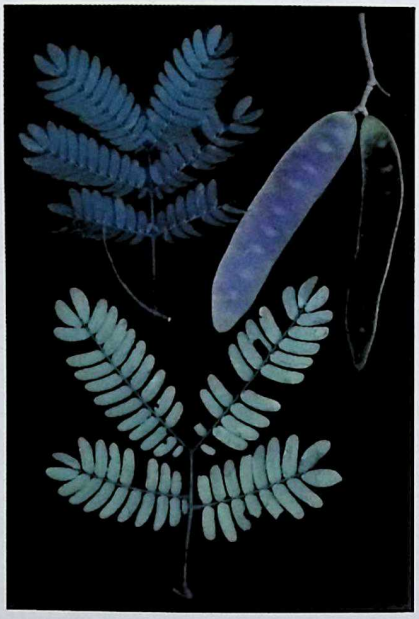
Albizia odoratissima (L. f.) Benth.

Botanical synonyms

Acacia lomatocarpa DC., *A. odoratissima* Willd., *Albizia odoratissima* var. *mollis* Benth. ex Baker, *Albizzia micrantha* Boivin, *Mimosa marginata* Lam., *M. odoratissima* L. f.

Common names

Bengali: kalakoroi, kakur siris, koroi, tetura; ***English***: black siris, Ceylon rosewood; ***Gujarati***: kalio-siris, kalo-sarasio; ***Hindi***: bansa, bhandir, kala siris, kalia; ***Kannada***: bilvara, bilwara; ***Konkani***: gondunchi, siros; ***Malayalam***: karintakara, karuvagei, mellivaka, pulivaga, selanni; ***Marathi***: chichwa, chikunda; ***Oriya***: bonosirisi, sirisi, sirocho, tinya; ***Punjabi***: karmaru, karmbru, lasrin, polach; ***Sanskrit***: shirisha, sirisa, sirasah, sirisha, svetashirisha; ***Tamil***: chittalei vagai, karuvagei, sela vagai; ***Telegu***: chinduga, karuyage, shinduga, telasu, yeruchinta.



Description

A medium-sized to large, erect tree up to 30 m tall with drooping dark green foliage; bark dark grey with numerous horizontal cracks; young branchlets minutely yellowish-brown pubescent, later glabrous. Leaves 10–30 cm long; rachis with gland beneath uppermost pairs of pinnae, and a larger oval gland at the base; pinnae 2–8 pairs, 5–20 cm long; leaflets 6–24 pairs, dark green, pubescent, 1.8–2.5 cm long and 0.6–1.2 cm wide, obliquely oblong, obtuse at base. Flowers yellowish-white, fragrant, sessile, arranged in numerous small 10–12-flowered, globose heads 2–2.5 cm in diameter; peduncles 6 mm long, solitary or 2–4 together, arranged in terminal panicles up to 30 cm long; calyx *c.* 1.3 mm long, pubescent; corolla 4 mm long, grey-silky outside, teeth ovate-lanceolate, acute. Fruit (pod) shortly stalked, 10–20 cm long and 2.5–3.8 cm wide, thin, flexible, glabrous, reticulately veined, purplish-green when immature, reddish-brown when mature; seeds 6–12, broadly ovate, flattened, yellow, 8 mm long and 6 mm wide. In peninsular India, flowering occurs from April to

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June, and fruits mature between November and April. In central India the tree remains leafless for 2–3 months between February and April.

Distribution and habitat

Native to the Indo-Malaysia region from India and Sri Lanka through mainland Southeast Asia to western Malesia. In India, it occurs naturally in dry and mixed deciduous forests in the sub-Himalayan hills up to 1500 m elevation and in peninsular India to an elevation of approximately 900 m.

Medicinal properties and uses

In Ayurveda, it is considered a substitute for *Albizia lebbeck*, the bark, leaf, flower, and seed being used in the treatment of leprosy, erysipelas, wounds, cough, dyspnoea, and as an antidote for snake bite and food poisoning. The leaves, boiled in *ghee* (clarified butter), are used as a cough remedy among the Santals. The powdered bark, taken with butter, is considered a tonic. Applied externally, the bark is considered effective in the treatment of leprosy and inveterate ulcers.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

Albizia procera (Roxb.) Benth.

Botanical synonyms

Acacia procera (Roxb.) Willd., *Mimosa procera* (Roxb.) Benth.

Common names

Bengali: karoi, kori, koroi, modeloa; ***English***: white siris; ***Gujarati***: karango; ***Hindi***: gurar, karhai, safed siris; ***Kannada***: adhanji, belati, chikul; ***Konkani***: quainai; ***Malayalam***: chalavaka, kotta vaga, karunthagara, vellavaka; ***Marathi***: gurar, kinhai, kinhi, kinni; ***Oriya***: garso, sarapatri, siris, suropotro; ***Sanskrit***: kinihi, sirisa; ***Tamil***: kondavagai, kondavaghe, velvagai; ***Telegu***: pedda patseru, tella chinduga, tella sopara.

Description

A large, deciduous tree up to 24 m tall with yellowish-brown bark; young shoots pale,

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lenticellate. Leaves bipinnate, main rachis glabrous, 0–45 cm long, with a large gland near base of petiole; pinnae 2–6 pairs, 12–15 cm long, their rachises glabrous with an oval gland below the uppermost pair of leaflets; leaflets 5–12 pairs, 2.5–3.8 cm long and 1.6–2.2 cm wide, dark green and glabrous above, more or less grey-pubescent beneath, apex obtuse, base obliquely cuneate on the upper and rounded on the lower margin; petiolules *c.* 1.2 mm long. Flowers whitish, sessile, borne in numerous small 12–20-flowered heads 1.5–2 cm across; peduncles 1.3 cm long, in fascicles of 3–5, arranged in terminal panicles; calyx 2.5 mm long, glabrous, teeth distinct, triangular; corolla 5 mm long, pubescent outside, teeth lanceolate, half as long as the corolla tube. Fruit (pod) 10–20 cm long and 1.3–2.2 cm wide, thin, flexible, reddish-brown when ripe, smooth and glossy, dehiscent; seeds 6–12 seeded, broadly ovate, *c.* 8 mm long and 6 mm wide, flattened, pale brown. In central India flowers between July and September and fruits between December and May.

Distribution and habitat

Native to tropical Asia from India and Sri Lanka to southern China and throughout Southeast Asia eastwards to New Guinea and northern Australia. In India, it is found in the sub-Himalayan hill forests from the Yamuna eastwards to West Bengal, and in the Satpura range between Maharashtra and Maharashtra southwards to Kerala and Tamilnadu, and in the Andaman Islands. Particularly common in low-lying moist savannahs in northeastern India and along streams and rivers in the hill forests of peninsular India; often planted.

Medicinal properties and uses

All above-ground parts of the plant are reported to show anti-cancer activity. Made into a poultice, the leaves are applied to promote healing of ulcers. A decoction of the bark is used to treat rheumatism and haemorrhage. The bark is also used as a fish poison.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935).

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Dichrostachys cinerea (L.) Wight & Arn.

Botanical synonyms

Acacia cinerea (L.) Spreng., *A. dalea* Desv., *Caelliea cinerea* Macbride, *Desmanthus cinereus* (L.) Willd., *Mimosa cinerea* L.

Common names

Gujarati: marud, vulontaro; ***Hindi***: bilatri, murmiar, vurtuli; ***Kannada***: odatarre, odavare, odavinaha, vaduvaradagida, wadu, yedathari; ***Marathi***: segumkati, sigamkati, yelati, yelatri; ***Oriya***: khoiridya; ***Sanskrit***: vellantara, vellantarah, viravriksha; ***Tamil***: piodai, vadatalla, vedathalam, vidattalai; ***Telegu***: veltori, veltura, veluthuru, veturu.

Description

A much-branched thorny shrub or small tree up to 6 m tall, often with a gnarled trunk; bark yellowish-grey, furrowed; branchlets stiff, spreading, ending in spines. Leaves bipinnate, rachis 2.5–4 cm long, more or less softly pubescent, with a small, erect gland between each pair of pinnae; stipules 4.5 mm long; pinnae 6–18 pairs, 1–1.6 cm long; leaflets minute, 10–20 pairs, sessile, closely packed, linear to lanceolate, base truncate, apex subacute, pubescent beneath, 1.5–3.5 mm long and 0.5–1 mm wide. Flowers numerous, crowded in dense axillary spikes 2.5–4.5 cm long, upper half of spike with fertile, yellow flowers, the lower half with barren pink or red flowers; calyx 0.8 mm long, membranous; corolla 2–2.5 mm long. Fruit (pod) linear or twisted when ripe, 5–7.5 cm long and 0.5–1 cm wide, glabrous, flat, dark brown, indehiscent; seeds 6–10, ellipsoid. In central India flowering occurs between September and November and fruiting from October to December.

Distribution and habitat

Widely distributed throughout the Old World tropics, it is typically found in the dry scrub forests and arid hills of north-western and peninsular India. In central India it is common on black cotton soils, typically forming thickets.

Medicinal properties and uses

In Ayurveda, the astringent root is used to improve appetite, and to treat rheumatism, joint pains, strangury, urine retention, bladder and kidney stones, as well as vaginal and uterine diseases. The extract from the pounded roots is administered orally to treat menstrual disorders among the Kolams of Andhra Pradesh. The tender shoots of the plant are bruised and applied to the eyes to treat ophthalmia.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Ravisankar and Henry (1992), Yoganarasimhan (1996).

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Entada pursaetha DC. subsp. *pursaetha*

Botanical synonyms

Entada scandens auct. non (L.) Benth., *E. schefferi* Ridl.

Common names

Bengali: gila, gilagach, pangra; ***English***: elephant creeper; ***Hindi***: chian, gila; ***Kannada***: doddakampi, hallekayi balli, haalu kaayi balli; ***Konkani***: gaer; ***Malayalam***: ahakkatlo, kakkavalli, malamanchadi, perunkakkavalli; ***Marathi***: garambi, garbe; ***Oriya***: geredi, giridi; ***Punjabi***: kastorikaman; ***Sanskrit***: gilla; ***Tamil***: chillu, irikki, sillu, vattavalli; ***Telegu***: gilatige, peddamadupu, tikatiyya.

Description

A gigantic, unarmed climber, with twisted, angled stems, and glabrous branches; bark brownish, fibrous, often rough at the base. Leaves bipinnate, ending in a woody tendril; petioles 5–9 cm long; leaf rachis 15 cm long; pinnae 2–3 pairs, 10 cm long; leaflets 3.8–7.5 cm long and 2–3.2 cm wide, elliptic-obovate, glabrous, subacute or emarginate at apex. Flowers yellowish-white, borne in peduncled, simple or panicled spikes up to 30 cm long; calyx *c.* 1.2 mm long, minutely 5-toothed; corolla 2.5–3 mm long. Fruits (pods) woody, jointed, up to 1.5 m long and 10 cm wide; seeds 5–30, circular, flattened, *c.* 5 cm across. The joints of the pod break away from the thickened sutures, which remain as an empty frame. Flowers from February to April and fruits from May to January.

Distribution and habitat

Native to tropical Africa and the Indian subcontinent. Found in semi-evergreen to wet deciduous forests throughout the eastern sub-Himalayan tract to an elevation of 1200 m from Nepal eastwards, in Bihar and Orissa as well as in the monsoon forests of the Eastern and Western Ghats; abundant in the Andaman Islands.

Medicinal properties and uses

The seeds, commonly used as a fish poison are considered tonic, emetic, antiperiodic, and anthelmintic; made into a paste, they are applied locally to relieve inflammatory and glandular swellings; they are reportedly used as an emetic. The juice extracted from the bark and wood is applied externally to relieve ulcers.

Warning

Although used medicinally in external applications, the seeds, stem and bark are poisonous.

References

Asolkar *et al.* (1992), Chatterjee and Pakrashi (1992), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935).

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Leucaena leucocephala (Lam.) de Wit

Botanical synonyms

Acacia biceps Willd., *A. frondosa* Willd., *A. glauca* (L.) Moench, *Leucaena glauca* Benth., *Mimosa glauca* L., *M. leucocephala* Lam.

Common names

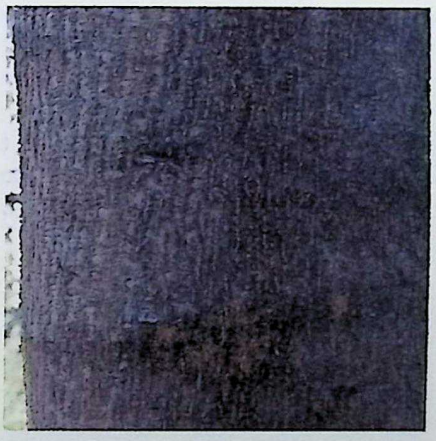
English: white popinac, lead tree, leucaena; ***Gujarati***: lasobaval, pardeshibaval, vilayatibaral; ***Hindi***: kubabul, kadam, toira; ***Malayalam***: takaranniram; ***Oriya***: nagarjan, rajokasundiri; ***Tamil***: nattuccavundal, tagarai, tagarai-virai; ***Telegu***: kaniti, kesari, nagari.

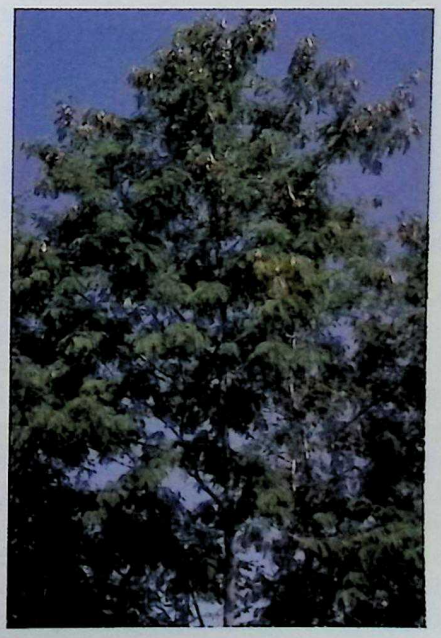
Description

A large unarmed shrub or a small tree, usually up to 9 m tall. Leaves bipinnate, 7.5–18 cm long, main rachis slender, channelled, ending in a weak spine; petioles 2.5–5 cm long; pinnae 3–8 pairs, 5–9 cm long, shortly stalked, their rachises pubescent; leaflets 10–15 pairs, linear-oblong, 10 mm long and 3 mm wide, membranous, glaucous, apex acute, base oblique. Flowers small, whitish, borne in dense globose heads; peduncles 2.5–3.8 cm long, slender, pubescent, elongate and often thickened in fruit; calyx 2.5–3 mm long, tubular-campanulate, membranous, teeth short, triangular; petals 4 mm long, spathulate-oblong. Fruits (pods) straight, flat, 12.5–15 cm long and 1.3–2 cm wide, obliquely triangular at apex, narrowed at the base into a stalk 6–13 mm long; seeds 15–25, flat, oblong, pointed, *c.* 8 mm long, dark brown, with hard, shining testa.

Distribution and habitat

Native to Mexico and Central America; introduced and naturalized almost throughout the tropics and subtropics. In





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India, it is cultivated in gardens and grown in plantations as a source of fuelwood and fodder throughout the plains; frequently naturalized.

Medicinal properties and uses

Although the species is not usually considered to have any medicinal value, the bark is reportedly eaten in Assam to relieve internal pains.

References

Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935).

Mimosa pudica L.

Common names

Bengali: lajah, lajjabati; ***English***: sensitive plant, touch-me-not; ***Gujarati***: lajalu, risamani; ***Hindi***: chui-mui, lajwanti, lajwati; ***Kannada***: lajja, mudugu-davare, muttidare muni, nachike; ***Malayalam***: tintarmani, tottavati; ***Marathi***: lajalu, lajri; ***Oriya***: dedhasurobarasuni, lajakuli, lajkuri, najuko; ***Punjabi***: lajwanti; ***Sanskrit***: lajjalu, lajjaluh, samanga, samangga; ***Tamil***: total vadi, tottalvadi, thottal-chinungi ; ***Telegu***: attapatti, peddanidrakanti, toda vadi; ***Urdu***: lajjalu.

Description

A diffuse, prickly, herb or undershrub, 45–90 cm tall; stems and branches sparingly prickly and clothed with long, weak bristles with bulbous bases. Leaves alternate, bipinnate; pinnae 1–2 pairs, digitately arranged, 5–7.5 cm long; petioles 2.5–5 cm long, bristly; stipules 8 mm long, their rachises clothed with ascending bristles; leaflets 10–20 pairs, 6–10 mm long and 2–4 mm wide, linear-oblong, sessile, coriaceous, glabrous above, clothed with appressed bristles beneath, acute at apex, base obliquely rounded, folding obliquely upwards when touched. Flowers pink, borne in globose heads 0.6–1.5 cm in diameter; peduncles 2–2.5 cm long, prickly, usually in axillary pairs along the branches; bracteole solitary, linear, acute, ciliolate; calyx very minute; corolla pink, 2–2.5 mm long, lobes 4, ovate-oblong, obtuse. Fruit (pod) flat, slightly recurved, straw-coloured, 1.3–2 cm long and 3–4 mm wide, consisting of 2–5 1-seeded joints whose sutures are clothed with spreading yellowish bristles 3 mm long. Flowers and fruits year-round. This species is highly variable in morphology, and includes three varieties in India: var. *hispida* Brenan, var. *tetrandra* DC. and var. *unijuga* Griseb.

Distribution and habitat

Native to tropical America, now naturalized throughout the tropical and subtropical parts of India in the plains districts in open wastelands. In many places it has become a troublesome weed.

Medicinal properties and uses

In Ayurveda the bitter, acrid root is considered cooling, antiseptic, vulnerary, alterative, alexipharmic, and useful for treating

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biliousness, leprosy, skin diseases, wounds, diarrhoea, dysentery, vaginal and uterine ailments, leucorrhoea, inflammations, asthma, leucoderma and blood diseases. In Unani practice it is considered resolvent and alterative and is used to treat bilious fevers, piles, jaundice, leprosy, ulcers and smallpox. In Siddha, the root and leaf are used to treat diabetes, sinus wounds, eye diseases, anuria and urinary calculi. A decoction of the root is reportedly used in southern India to treat gravel and other urinary complaints. In southern Orissa the liquid paste of the roots pounded in water is used to treat diarrhoea. A paste of the leaves is applied to relieve glandular swellings. The leaf juice is used in dressings for sinus conditions and as an application for sores, fistula and haemorrhoids.

References

Chatterjee and Pakrashi (1992), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Katewa and Arora (1997), Kirtikar *et al.* (1935), Mohanty *et al.* (1996), Sivarajan and Balachandran (1994), Yoganarasimhan (1996).

Mimosa rubicaulis Lam.

Botanical synonym

Mimosa octandra Roxb.

Common names

Bengali: kuchikanta, shiahkanta; ***Hindi***: agla, ail, ar, shiah-kanta; ***Kannada***: rasne, urisige; ***Malayalam***: kattusinikka; ***Marathi***: chilati; ***Oriya***: dontari, rasna; ***Punjabi***: alla, arlu, didriar, kikkri, riaul; ***Sanskrit***: rata-arlu, sajjaka, sallaka, sarja, sarjarasah; ***Tamil***: igai, indangodi, ingai; ***Telegu***: kodimudusu, undra, ventra.

Description

An erect or straggling deciduous shrub, 1.5–3 m tall, with smooth bark and thorny, glabrous branchlets. Leaves bipinnate, rachis 10–12 cm long; pinnae 5–12 pairs, 2.5–6.3 cm long; leaflets 6–20 pairs, 3.8–7.5 mm long and 2–3 mm wide, oblong, mucronate at apex, obliquely rounded or truncate at base. Flower heads 1.5 cm across, reddish at first, fading to white, in globose pedunculate heads 1.2–1.5 cm in diameter, peduncles 2.5–5 cm long, pubescent, in axillary fascicles forming large terminal leafy panicles; calyx minute, ciliolate; corolla 3 mm long. Fruits (pods) 7.5–10 cm long and 1 cm wide, falcate, glabrous, without prickles, joints 4–10, each 1-seeded. Flowering occurs mainly between July and September and fruiting from November to January; in central India plants remain leafless between January–February and June.

Distribution and habitat

Throughout India to an elevation of 1000 m in the outer Himalayas. It is common along watercourses, in heavily grazed

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scrub forests, grasslands, and abandoned cultivated lands in dry deciduous forest zones.

Medicinal properties and uses

An infusion of the leaves is reportedly used to treat haemorrhoids and the crushed leaves are applied to relieve burns. The dried, powdered root is used to prevent vomiting.

References

Chatterjee and Pakrashi (1992), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935).

Pithecellobium dulce (Roxb.) Benth.

Botanical synonyms

Albizia dulcis (Roxb.) F. v. Mueller, *Inga camatchili* Perr., *I. dulcis* (Roxb.) Willd., *I. javanica* DC., *I. pungens* H.B.K. ex Willd., *Mimosa dulcis* Roxb., *M. pungens* Poir.

Common names

Bengali: dekhani babul; ***English***: guamuchil, Madras thorn; ***Gujarati***: ekadati, vitayatiambli; ***Hindi***: dakhani babul. jangle jalebi, vilayati babul, vilayati imli; ***Kannada***: kottampuli, simahunase, simehunise; ***Malayalam***: korukkapuli; ***Marathi***: hatichinch, vilayati chinch; ***Oriya***: simakoina; ***Tamil***: karkapilli, kodukkappuli, konapuli, korukapuli; ***Telegu***: simachinduga, simachinta.

Description

A small to medium-sized, evergreen tree, up to 18 m tall, unarmed or with spiny stipules or axillary spines; bark smooth, grey, with yellowish lenticels on young trees, or rough, wavily fissured and peeling on old trees. Leaves bipinnate, 4–8 cm long; petioles up to 2.5 cm long; pinnae a single pair, each pinna bearing a single pair of leaflets; leaflets 1–4 cm long, obliquely oblong obtuse at both ends. Flowers small, white, borne in dense cylindrical spikes or globose heads 1 cm in diameter; peduncles solitary or fascicled in the axils of small bracts along slender branchlets; calyx campanulate or funnel-shaped, short-toothed; corolla funnel-shaped, petals valvate. Fruits (pods) turgid, curved or twisted, 10–18 cm long and *c.* 1 cm wide, dehiscent along the lower suture, the valves reddish when ripe; seeds 6–10 per pod, shining

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black, enveloped in a pink to whitish, edible, pulpy aril. Flowers and fruits from January to May in southern India.

Distribution and habitat

Native to tropical America from Mexico to northern Colombia and Venezuela. Cultivated for fuel and as a hedge plant throughout the plains districts of India; often naturalized. Its rapid growth, coppicing ability, and tolerance of very poor soils and drought-resistance have made it a popular tree for rehabilitation of degraded lands in India.

Medicinal properties and uses

The bark is reported to be used as an astringent in the treatment of dysentery, and as a febrifuge, although it also contains irritant principles which cause

dermatitis and inflammation of the eyes. The leaves possess astringent, emollient and abortifacient properties.

References

Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935).

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Fabaceae-Papilionoideae

Abrus precatorius L.

Botanical synonym

Glycine abrus L.

Common names

Bengali: chunhati, gunch, kunch; ***English***: abrus, crab's eye, Indian licorice, jequirity, rosary pea; ***Gujarati***: chanothi, gunja; ***Hindi***: arak kawat, chirmiti, ganchi, ghungchi, gun, gunchi, karjini, kunch, pondkawat, rakti, rati; ***Kannada***: galagangi, ganji, gulganji, gulganju, gunji, madhuka; ***Malayalam***: kakani, kunni, kunnikuru; ***Marathi***: chanoti, gun, gunchi, gunja; ***Oriya***: gunja, kaincho, runji; ***Punjabi***: labri, ratak; ***Sanskrit***: gunja, kakanantika, kakananti, krishnala, raktika, tulabija; ***Tamil***: gundumani, kuntumani; ***Telegu***: guriginja, guruginia, guruvenda, thella guriginja; ***Urdu***: ghunchi.

Description

A deciduous climber with slender, flexible and tough branches; stems up to 4.5 m high and 1.2 cm in diameter; young branches mostly greenish-yellow. Leaves 5–12 cm long, pinnate, rachis ending in a soft bristle; leaflets usually 9–12 pairs, linear or linear-oblong, to 2.5 cm long and 0.6 cm wide, entire, rounded at both ends, glabrous above and thinly appressed-silky beneath; stipules deciduous. Flowers white, tinged with pink, pale purple or yellow, 1–1.3 cm long, borne in fascicles on curved axillary racemes or short axillary branches 5–10 cm long. Fruit (pod) rectangular, thick, hard, wrinkled, pubescent, 2.5–4.3 cm long and 1–1.3 cm wide with a sharp deflexed beak; seeds 3–6, ovoid, scarlet with a black spot, or uniformly black or white, polished, attached to pod by a small white aril. Flowers from September to October and fruits from November to February in central India.

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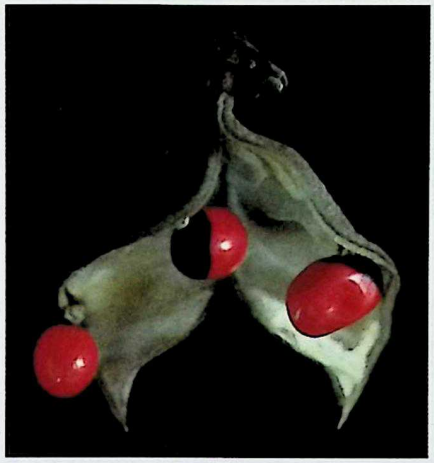
Distribution and habitat

A pantropical species found throughout India in deciduous forests to an elevation of 1000 m in the outer Himalayas. Sometimes planted in gardens.



Medicinal properties and uses

The roots, leaves and seeds are used medicinally in a number of compound Ayurvedic preparations. The roots and leaves contain glycyrrhizin, the principal constituent of liquorice, and are used as a substitute for liquorice to treat coughs and catarrhal affections. The roots possess tonic, diuretic, emetic and alexiteric properties and are used in preparations prescribed for gonorrhoea, jaundice and haemoglobinuric bile. The roots, pounded with cane sugar, are mixed with water and taken internally to treat peptic ulcers by the Kolams of northern Andhra Pradesh. The Gonds of Uttar Pradesh reportedly use an extract of the root to treat syphilis and, mixed with the root extract of *Asparagus racemosus* (*Asparagaceae*) and the plant of *Cuscuta reflexa* (*Convolvulaceae*), as a female contraceptive. Among the Rabaris in the Barda Hills of Gujarat, an extract of the root is taken internally to treat rheumatism. The leaves have a sweetish taste and are often eaten raw or cooked; steeped in warm mustard oil, they are applied externally to relieve arthritic pains. A decoction of the fresh leaves or roots is widely used to relieve coughs, colds and colic. In northeastern Karnataka, a water extract of the leaves is given orally on a daily basis for 15 days for blood purification. In this region a decoction of the leaves is used as an emetic, and the fresh, pounded leaves are applied to treat ulcers. The leaf juice is used in the Konkan (Maharashtra) to relieve hoarseness and, mixed with oil, is applied to relieve painful swellings. The leaves are also considered useful for treating biliousness and leucoderma (admixed with *Plumbago zeylanica* root), itching and other skin diseases. Ground to a paste, the seeds are reportedly useful as an external application for treating skin diseases, ulcers, sciatica, shoulder stiffness, paralysis and other nervous disorders. Seed extracts reportedly exhibit anti-cancer activity.

Warning

The seeds are highly poisonous, containing abrin, a highly toxic protein and powerful irritant similar to ricin, derived from castor seeds (*Ricinus communis*: *Euphorbiaceae*). Although they are reportedly used as a purgative, emetic, contraceptive, abortifacient and vermifuge, they should not be taken internally.

References

Asolkar *et al.* (1992), Chatterjee and Pakrashi (1992), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Jadeja (1999), Kirtikar *et al.* (1935), Ravisankar and Henry (1992), Seetharam *et al.* (1999), Singh and Prakash (1994), Sivarajan and Balachandran (1994), Vijaya Kumar and Pullaiah (1998), Yoganarasimhan (1996).

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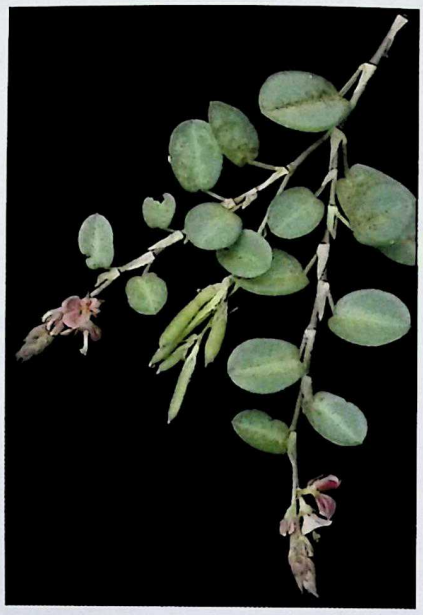
Alysicarpus vaginalis (L.) DC.



Botanical synonyms

Alysicarpus nummularifolius DC., *A. vaginalis* var. *nummularifolius* Baker, *Hedysarum vaginale* L.

Common names

English: alyce clover, one-leaved clover; ***Gujarati***: gaadar, gaadar samerwo; ***Marathi***: dhakta dhampta; ***Tamil***: namappoondu.

Description

A decumbent-ascending or prostrate perennial herb with glabrous branches, 30–90 cm tall. Leaves simple, variable in size and shape on a single plant, 0.7–4 cm long and 0.7–1.5 cm wide, broadly to narrowly oblong or obovate, base subcordate or truncate, apex acute or emarginate, usually hairy; petioles 0.3–1.4 cm long; stipules to 1.2 cm long. Flowers small, red or pinkish-yellow, borne in pairs subtended by a stipule-like bract, in lax, downy, axillary or terminal racemes to 5 cm long. Fruits (pods) nearly round or cylindrical, up to 2.5 cm long, 6–9-jointed; seeds smooth, brownish-yellow, 2 mm in diameter. Flowers and fruits from September to April.

Distribution and habitat

Found throughout tropical Africa and Asia; introduced and naturalized in parts of tropical America. Common throughout India on roadsides, lawns, and in pastures to an altitude of 1200 m.

Medicinal properties and uses

The roots are used in Bihar for treating leprosy and urinary troubles. Their decoction is prescribed for cough in Java. Among the tribal inhabitants of eastern Bihar, the root paste and powdered dried root are used to treat snake bite; the root juice is taken by women in this region as an oral contraceptive. The boiled leaves are used as a purgative. The plant is credited with antipyretic, antiperiodic and expectorant properties; it is used in Sri Lanka to treat skeletal fractures. Leaf extracts possess anti-cancer activity. The plant is sometimes cultivated as a soil improver.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956), CSIR (1948–1992), Jha and Varma (1996).

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Atylosia scarabaeoides (L.) Benth.

Botanical synonyms

Cantharospermum pauciflorum Wight & Arn., *Dolichos scarabaeoides* L.

Common names

Bengali: banur-kalai; ***Oriya***: bankulthia.

Description

A small, slender herbaceous climber with densely grey-downy stem. Leaves trifoliate, leaflets to 4.5 cm long and 2.2 cm wide, elliptic to elliptic-oblong, acute to obtuse, subcoriaceous, grey-pubescent and strongly nerved beneath; stipules acute, about 1 mm long, persistent. Flowers yellow, 0.8 cm long, in 1–2-cm-long corymbose racemes, or reduced to 1–2 on short peduncles; calyx densely grey-silky, teeth linear; corolla 8–10 mm long, keel abruptly incurved at the tip. Fruits (pods) to 2.5 cm long and 6 mm wide, densely clothed with golden, appressed hairs, 2–6-seeded; seeds to 5 mm long and 3 mm wide. Flowers and fruits between August and November in central India and between October and February in Karnataka.

Distribution and habitat

Native to the Indo-Malaysia region and China. Commonly found throughout India in hedges, grassy areas and open forests from sea level to an elevation of 1800 m in the Himalayas and to lower elevations in the Western Ghats.

Medicinal properties and uses

The plant is reportedly useful for the treatment of dropsy, fever, pains, sores, anaemia, cholera and dysentery. The crushed leaves are applied locally to relieve itching among the Paudi Bhuinya in northern Orissa. Among the tribal inhabitants of southern Bihar, the whole plant pounded together with the stem bark of *Careya arborea* (*Lecythidaceae*), is given with water to relieve diarrhoea. The crushed seeds are given as a remedy for tapeworm among the Mundas. The dried, powdered root is used to relieve stomach-ache by the Kondhs of southwestern Orissa. The leaves and green pods are eaten as a pot-herb.

References

Aminuddin and Girach (1996), Asolkar *et al.* (1992), Chopra *et al.* (1956), CSIR (1948–1992), Girach (1992), Girach and Aminuddin (1995), Kirtikar *et al.* (1935).

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Butea monosperma (Lam.) Taub.

Botanical synonyms

Butea frondosa Koenig ex Roxb., *Erythrina monosperma* Lam.

Common names

Bengali: kinaka, palas, paras, polashi; ***English***: flame of the forest; ***Gujarati***: kakria, kesudo, khakara, khakharo, palasso, phullas; ***Hindi***: chinchra, dhak, palas, paras; ***Kannada***: brahmavriksha, mathuga, mutthugada mara, muttuga, palasa, plashu, thoras; ***Malayalam***: brahmavriksham, mukkappuyam, palas, palasin samatha; ***Marathi***: palas, paras, phulas; ***Oriya***: kinjuko, palasa, polas, porasu; ***Punjabi***: chachra, dhak, palas; ***Sanskrit***: kinsuka, palasa, palasha; ***Tamil***: murukkan, palasu, punamurukku, purasu; ***Telegu***: modhugu, moduga, palasamu; ***Urdu***: palash, palash-papra.

Description

A medium-sized deciduous tree up to 15 m tall with bluish-grey or light brown bark. Leaves alternate, trifoliate; petioles 10–15 cm long; stipules linear-lanceolate, deciduous; leaflets coriaceous, 10–22 cm long and 8–20 cm wide, broadly ovate from a cuneate or deltoid base, glabrescent above, densely finely silky below with raised nerves. Flowers showy, bright orange-red, occasionally yellow, borne in racemes 15 cm long on leafless branches; rachis and calyx dark olive-green velvety; pedicels twice as long as the calyx, densely brown-velvety; calyx 1.3 cm long, teeth short; corolla 3.8–5 cm long, clothed outside with silky silvery hairs, standard 2.5 cm broad, keel semicircular, beaked, veined. Fruit a brown indehiscent, flat, thin pod, 12.5–20 cm long and 2.5–5 cm wide, distinctly stalked, reticulately veined, silky tomentose; seeds flat, kidney-shaped, 3.3–3.8 cm long and 2.2–2.5 cm wide. Flowers from January to May and fruits from May to June; trees leafless between January–February and April–May in central Indian deciduous forest regions.

Distribution and habitat

Its native range extending from the tropical Himalayas to an elevation of 800 m southwards and eastwards to Sri Lanka, Southeast Asia and Malesia, this is one of the most common trees in the plains of India. It occurs in all dry districts, often gregariously in open grassland habitats and usually scattered in deciduous forests; particularly common in peninsular India on black cotton soils.

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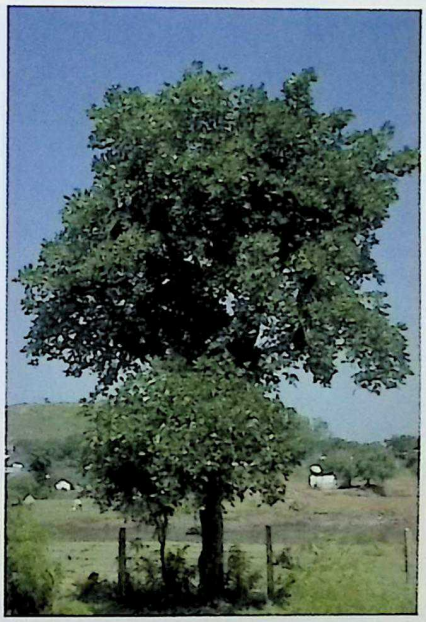

Medicinal properties and uses

The red juice exuded from the cut bark is applied to ulcers and to relieve septic sore throat. Upon drying, the juice forms brittle, water-soluble beads known as *butea gum* or *Bengal kino*, highly valued for its medicinal properties. It is a powerful astringent, given internally to treat diarrhoea and dysentery. Its infusion is occasionally used as a local application for leucorrhoea. A solution of the gum is applied to bruises and erysipelatous inflammations and ringworm. The stem bark is considered astringent, bitter, acrid, alterative, aphrodisiac and anthelmintic. In Ayurveda it is used to treat bone fractures, ulcers, tumours, colic, intestinal worms, bleeding piles, dysentery, haemorrhages, amenorrhoea and dysmenorrhoea; In Unani medicine it is considered useful for treating liver disorders, biliousness, dysmenorrhoea and gonorrhoea. Among the Gonds of Uttar Pradesh, the juice of the stem bark is given in the treatment of dysentery. In northeastern Karnataka the bark extract is taken with water as a remedy for fevers. A decoction of the bark is prescribed for coughs, colds, fever, various forms of haemorrhages, in menstrual disorders, and is used in the preparation of tonics and elixirs. The filtrate of the boiled stem bark is used as a bath for patients suffering from jaundice among the Gonds and Kolams of northern Andhra Pradesh. The roots, ground with water to form a paste, are applied to the chest to relieve congested lungs by the tribal inhabitants of Madhya Pradesh. The roots are used to treat elephantiasis and night blindness. They are also reported to cause temporary sterility in women. The root bark is used as an aphrodisiac and as an analgesic and anthelmintic. It is used to treat sprue, piles, ulcers, tumours and dropsy. The leaves are credited with astringent, tonic, diuretic and aphrodisiac properties. In Ayurveda they are considered useful for treating eye diseases and in Unani practice they are used externally to cure boils, pimples and tumorous haemorrhoids, and are given internally to treat flatulent colic, worms and piles. In southern Orissa the raw leaf extract is used internally to treat diarrhoea. An extract of the crushed leaves, mixed with the tender leaves of *Ricinus communis* (*Euphorbiaceae*), is used to treat jaundice in northeastern Karnataka. The flowers are reported to possess astringent, diuretic, depurative, aphrodisiac and tonic properties; they are used in Ayurveda to treat leprosy, strangury, gout, skin diseases, and their juice for eye diseases. In Unani medicine the flowers are used to relieve biliousness, inflammation and gonorrhoea. Among the tribal inhabitants of Madhya Pradesh, a paste of the flowers is applied to the chest to relieve asthma, and the water in which flowers are soaked overnight is used to relieve sunstroke. Elsewhere they are used as an emmenagogue, and as a poultice to relieve

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orchitis, swellings and sprains. They are also considered effective for the treatment of leprosy, leucorrhoea and gout. A cool infusion of the flowers is taken in the treatment of diabetes among the Sahariyas of northwestern Madhya Pradesh. A decoction of the petals is given to treat diarrhoea and to puerperal women. The expressed juice from the flowers or an infusion of the flowers is given to treat diarrhoea and dysentery among the tribal inhabitants of southern and eastern Bihar. The seeds have a faint odour and a slightly bitter, acrid taste; they are useful for treating flatulence and piles. Pounded with lemon juice, the seeds act as a powerful rubefacient and are used to cure ringworm and other skin diseases. The powdered seeds are given to remove intestinal worms among the tribal inhabitants of eastern Bihar, and for treating amenorrhoea by tribal women in southern Bihar. An extract of the seeds, flowers and leaves is reputed to have contraceptive properties. Aside from their medicinal uses, the leaves are commonly used used for making platters, cups and for wrapping food. The bark is reportedly useful as an insecticide against house flies.

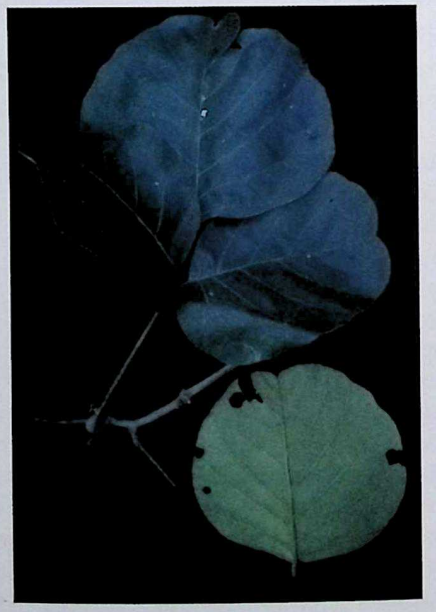
References

Asolkar *et al.* (1992), Chatterjee and Pakrashi (1992), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Girach and Aminuddin (1995), Jha and Varma (1996), Kirtikar *et al.* (1935), Mohanty *et al.* (1996), Seetharam *et al.* (1999), Shah and Singh (1990), Sikarwar and Kaushik (1992), Singh and Prakash (1994), Sivarajan and Balachandran (1994), Varma (1997), Yoganarasimhan (1996).

Butea parviflora Roxb.

Botanical synonyms

Butea sericophylla Wall., *Spatholobus parviflorus* (Roxb.) O. Kuntze, *S. roxburghii* Benth.



Common names

Hindi: bando (fruit), maula; ***Kannada***: mukkateballi; ***Malayalam***: athambu, athambuvalli, chamatha; ***Marathi***: phalsan; ***Oriya***: poraso; ***Tamil***: pilacchivalli, plashivalli; ***Telegu***: bodegateega.

Description

A gigantic woody climber, up to 24 m in length and 30 cm in stem diameter; bark reddish-brown, smooth on smaller stems, rough on large stems. Leaves trifoliate, rachis 1–1.5 cm long; leaflets subcoriaceous, 10–23 cm long and 4–13 cm wide, variable in shape, broadly obovate-ovate; apex obtuse or abruptly acute; base cuneate or rounded, silky pubescent; primary lateral veins about 8 pairs, prominent beneath; petioles up to 12 cm long. Flowers bright red to white or cream with a pink tinge, covered with a reddish-brown tomentum, 0.8–1 cm long, borne in large, axillary or terminal panicles. Fruits (pods) 7–12 cm long and *c.* 2.5–4 cm wide, broader at base than apex, 1-seeded.

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Distribution and habitat

Common throughout India, Bangladesh, Myanmar (Burma) and the Andaman islands to an elevation of *c.* 900 m.

Medicinal properties and uses

The ashes of the leaves, mixed with molasses, are given as a vermifuge. A decoction of the bark is reportedly used for treating dropsy and bowel complaints. The plant possesses insecticidal and piscicidal properties.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956), CSIR (1948–1992).

Butea superba Roxb.

Common names

Bengali: latapalash, latapalasha; ***Gujarati***: velkhadar, velkhakharo; ***Hindi***: bela palas, bodha, chihumt, palas lata; ***Kannada***: mullumuttuga, mutthugada balli, muttugina-balli, nalli mutthuga; ***Marathi***: beliapalas, beltivas, palasavela, palasvel, yelparas; ***Oriya***: hoi palas, noipolaso, polasnoi; ***Sanskrit***: lata palas, latapalasha; ***Tamil***: kodi marukkan, kodimurukkan; ***Telegu***: modugaige, tigemoduga, tivvamoduga.

Description

A very large, deciduous, woody climber with stems up to 30 cm in diameter. Leaves trifoliate, leaf rachis 10–15 cm long; leaflets rhomboid or broadly ovate, obtuse or retuse, up to 45 cm long. Flowers showy, deep yellow, orange or orange-scarlet, 4.5–6.3 cm long, borne in profusion along leafless branches on racemes usually 8–12 cm long, occasionally to 30 cm long. Fruits (pods) 12.5–15 cm long, distinctly stalked. Flowers from March to April and fruits between June and October.

Distribution and habitat

Found in deciduous hill forests from Uttar Pradesh to West Bengal and Assam, southwards through peninsular India to Tamilnadu. Also occurs in Bangladesh, Myanmar (Burma) and Sri Lanka.

Medicinal properties and uses

The leaf juice, mixed with curd (yoghurt) and yellow zedoary (*Curcuma aromatica*: *Zingiberaceae*) is given to treat heat-eruptions in children. The seeds are used extensively as a sedative and anthelmintic. A decoction of the seeds, or of the stem and leaves, is considered emollient and is used topically for piles. The seed oil is anthelmintic and hypotensive. The gum is used as a tonic and poultice. A paste of the stem bark is taken internally by the tribal inhabitants of Bastar (Madhya Pradesh) as a remedy for haematuria. Among the tribal inhabitants of Madhya Pradesh, the roots are ground with water and applied externally for relief of weeping eczema. In Ayurvedic practice the bark, flower, seed and resin are used as substitutes for those of *Butea monosperma*.

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Asolkar *et al.* (1992), Chatterjee and Pakrashi (1992), Chopra *et al.* (1956), CSIR (1948–1992), Hemadri and Rao (1989), Kirtikar *et al.* (1935), Shah and Singh (1990), Yoganarasimhan (1996).

Cajanus cajan (L.) Millsp.

Botanical synonyms

Cajanus indicus Spreng., *C. obcordifolia* Singh, *Cytisus cajan* L.

Common names

Bengali: arhar, tur, tuver; ***English***: pigeonpea; ***Gujarati***: dangri, turdal, tuver; ***Hindi***: arhar, tur, tuver; ***Kannada***: thogari bele, thuvara; ***Konkani***: tori; ***Malayalam***: adhaki, kakshi, thuvara; ***Marathi***: arhar, tur, turi, tuver; ***Oriya***: horodo, kandulo; ***Punjabi***: arhar, dinger, tohar; ***Sanskrit***: adhaki, tuvarika, tuwari; ***Tamil***: adagam, iyavai, paruppu, thovary, tuvarai; ***Telegu***: adhaki, ettakandulu, kandula, kandulu, peddakondakandi; ***Urdu***: arhar.

Description

An erect, annual or perennial, hairy herb or shrub up to 4.3 m tall. Leaves trifoliate; leaflets lanceolate or narrowly elliptic, up to 8 cm long and 3.5 cm wide, apex acute to mucronate, base acute, margins entire, subcoriaceous; venation strongly reticulate, prominent beneath. Flowers yellow, or yellow veined with red or purple, borne in sparse, distinctly peduncled, densely hairy, corymbose axillary racemes, or often in terminal panicles. Fruits (pods) 5–7.5 cm long and 0.6–1.3 cm wide, finely downy, 3–7-seeded; seeds greyish-brown, red or pale yellow. In addition to numerous cultivars, two botanical varieties are recognized in India: *C. cajan* var. *bicolor* DC. (Hindi: *arhar*), the more common bushy, perennial types bearing purple-streaked, yellow flowers and dark-coloured pods, and *C. cajan* var. *flavus* DC. (Hindi: *tur*), the smaller, early-maturing types bearing yellow flowers and plain pods containing 2–3 seeds (illustrated here).

Distribution and habitat

Believed to be indigenous to Southeast Asia, it is one of the most important pulse crops in India, cultivated throughout most of the country and throughout the tropics, to an altitude of 1800 m in the Himalayas.

Medicinal properties and uses

In Bankura District, West Bengal, a paste of the leaves with salt and water is taken on an empty stomach to treat jaundice; in tribal-dominated areas of north-central Uttar Pradesh, the leaf juice mixed with black pepper and buttermilk is given for the same purpose. The seeds and leaves, made into a paste and warmed, are sometimes applied over the mammae to check milk secretion. A paste of the leaves or flowers is used to relieve inflammation or sores on the mouth and tongue. A poultice prepared from the pounded leaves is used to relieve swellings.

References

Asolkar *et al.* (1992), Chatterjee and Pakrashi (1992), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935), Rao *et al.* (1996), Singh and Prakash (1998).

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Cicer arietinum L.

Common names

Bengali: but, butkalai, chhola; ***English***: Bengal gram, chickpea; ***Hindi***: but, chana, chanaka; ***Kannada***: karikadale, kempukadale, kudoly; ***Konkani***: chono; ***Marathi***: harbara; ***Punjabi***: channa, chola; ***Sanskrit***: canaka, canakah, chanaka; ***Tamil***: kadalai; ***Telegu***: harimandhakam, sanagulu; ***Urdu***: but, chana.

Description

An erect or spreading, much-branched annual herb, 30–50 cm tall, covered with glandular hairs. Leaves pinnately compound, 2.5–5 cm long, usually with a terminal leaflet; stipules small, obliquely ovate, toothed; leaflets 9–17, *c.* 6 mm long, ovate, oblong or obovate, deeply cut, strongly veined. Flowers white to various shades of pink or blue; peduncle 1.3–2 cm long, jointed near the middle; calyx 6–8 mm long, teeth linear; corolla about half as long as the calyx. Fruits (pods) 2–2.5 cm long, round or nearly so, turgid, pubescent, somewhat wrinkled; seeds 1–2, obovate or subglobose, beaked, variable in colour (yellow, fawn, green, orange-brown, pink or black), smooth, granular or tuberculate. Flowers from February to March and fruits in April and May.

Distribution and habitat

Though no longer known in its wild state, the centre of origin of the species is believed to be in western Asia. Cultivated for an estimated 7000 years, there are today numerous varieties and cultivars used worldwide. In India, it is cultivated throughout the country as a pulse crop.

Medicinal properties and uses

Aside from the economic importance and nutritional value of the seeds, the plant is used medicinally in India. In Ayurveda, the leaves are considered astringent to the bowels and useful for improving taste and appetite and in the treatment of bronchitis. The leaf powder mixed with that of *Tridax procumbens* (*Asteraceae*) in a 1 : 2 ratio, is taken orally to treat diabetes among the tribal inhabitants of Udaipur District in Rajasthan. The boiled leaves are applied to relieve sprains and dislocated limbs. The acidic exudate from the plant is astringent and used to treat indigestion, diarrhoea and dysentery. The leaf juice is stomachic and laxative. The seeds are considered stimulant, tonic, aphrodisiac, anthelmintic and useful for treating bronchitis, biliousness, leprosy and other skin diseases. When fried, they are diuretic, and when roasted are used as an aphrodisiac. Powdered seeds, mixed with those of *Psoralea corylifolia* (*Fabaceae-Papilionoideae*) and neem (*Azadirachta indica*: *Meliaceae*), are reported to cure leucoderma. Germinated seeds are used as a prophylactic against vitamin deficiency diseases, particularly scurvy.

References

Asolkar *et al.* (1992), Chatterjee and Pakrashi (1992), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Katewa and Arora (1997), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

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Clitoria terneata L.

Botanical synonym

Terneata vulgaris H.B.K.

Common names

Bengali: aparajit, aparajita; ***Gujarati***: garani, garni, koyola; ***Hindi***: aparajit, aprajita, khagia, vishnukranti; ***Kannada***: balli, giridarn, girikarnike, pushpaballi, sankha; ***Konkani***: cazuli; ***Malayalam***: aral, kakkanamkoti, sankhankuppi, shankhapushpam; ***Marathi***: gokaran, gokurna, kajli, kogarni, sholonga; ***Oriya***: onasi, oporajita; ***Sanskrit***: aparajita, asphota, girikarnika, sankhapuspi, shankapushpi, vishnu-kranta; ***Tamil***: kakkanam, karka, kartun, sangu pushpam; ***Telegu***: dintena, nala-ghetana, nallavusinitige; ***Urdu***: mazeriyunihindi.

Description

A slender, climbing or suberect herb to about 2 m long. Leaves odd-pinnate, leaf rachis to 8 cm long; leaflets 5–7, 2–5 cm long and 1.2–3 cm wide, elliptic, apex obtuse, base cuneate to rounded, obtuse or retuse, glabrous above, pubescent beneath. Flowers ranging in colour from white to deep blue, axillary, solitary; peduncles 0.6–1 cm long. Fruit (pod) linear-oblong, flat, *c.* 10 cm long and 1 cm wide, sharply beaked, appressed hairy; seeds 6–10, compressed. Flowers and fruits year-round, but mainly between July and December in central India.

Distribution and habitat

Probably native to tropical America, now naturalized throughout the tropics. In India it is cultivated in gardens as an ornamental and is often naturalized, growing over hedges and thickets.

Medicinal properties and uses

In Ayurveda the bitter roots of the white-flowered variety are considered cooling, acrid, laxative, diuretic, alexiteric, anthelmintic and tonic to the brain; they are used to treat eye diseases, corneal ulcers, tuberculous glands, elephantiasis, headache, leucoderma, biliousness, inflammations and ulcers. Those of the blue-flowered variety are credited with similar properties and are used for the same purposes, but in addition are used to treat dysentery, severe bronchitis, asthma, consumption, ascites and abdominal enlargement. In Unani medicine, the roots

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are used as a purgative and diuretic and for treating ascites. A decoction of the root bark is reportedly given as a demulcent for relieving irritation of the bladder and urethra. The seeds are a powerful purgative. The roasted seed powder is given to relieve abdominal pain, dropsy and liver disorders among tribal and rural inhabitants of Bhavnagar District in Gujarat. The Irulars of Tamilnadu use the paste of the flowers as an external application to treat eye infections and headache; they also use the whole plant as an antidote for snake bite.

References

Asolkar *et al.* (1992), Bhatt and Mitaliya (1999), Chatterjee and Pakrashi (1992), Chopra *et al.* (1956, 1969), Kirtikar *et al.* (1935), Ragupathy and Mahadevan (1991), Sivarajan and Balachandran (1994), Yoganarasimhan (1996).

Crotalaria juncea L.

Common names

Bengali: sanai, shonpat, ghore sun; ***English***: Indian hemp, sun hemp; ***Gujarati***: san, suna; ***Hindi***: san, sanai, suna, sunn; ***Kannada***: henna, pundi, sanabu, sanna senabu; ***Konkani***: sanu, son; ***Malayalam***: chanaka, dhunam, kattuttantalakatta, pulivanni, sanam, wuckoo nar; ***Marathi***: ghagharu, san, santag; ***Oriya***: choni, sono; ***Sanskrit***: sana, sanah, shanapuspi; ***Tamil***: janupa, sanal, sannapu; ***Telegu***: janumu, shanama.

Description

An erect, stiff, annual herb or undershrub to 3 m tall; stems and branchlets grooved, covered by silky brownish hairs. Leaves simple, 2.5–10 cm long and 0.5–2 cm wide, linear or oblong-lanceolate, base obtuse, apex apiculate, clothed on both sides with appressed-silky, shining hairs; petioles 1.2–2.5 mm long, stipules absent or minute. Flowers to 2 cm long, borne in erect, terminal, 12–20-flowered racemes up to 30 cm long; pedicels 3–6 mm long, pubescent; bracts minute, linear subulate; bracteoles 2 beneath the calyx, minute; calyx 2 cm long, clothed with fulvous hairs, teeth linear-lanceolate; corolla bright yellow, standard ovate-oblong, sub-

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acute. Fruit (pod) velvety, 10–15-seeded, 2.5–3 cm long. Flowers mainly from September to January and fruits from December to February in central India.

Distribution and habitat

Native to India but widely distributed elsewhere in the tropics. It is one of the most commonly cultivated crops in India from the Himalayas southwards, and in Sri Lanka, ranking next to jute in importance as a bast-fibre crop; frequently naturalized.

Medicinal properties and uses

The seeds are used to purify blood and in the treatment of impetigo, psoriasis and other skin diseases, and as an emmenagogue. In Ayurveda, the leaves are used as an emetic, laxative, abortifacient and analgesic, and for treating diarrhoea, dysentery and bleeding disorders; the flowers for treating leucorrhoea and blood diseases. A paste of the leaves is used as an external application to relieve swellings, leprosy and other skin diseases, and the juice of the leaves is used in southern India, both internally and externally, for treating scabies and impetigo.

Warning

The plant is known to cause hepatic veno-occlusive disease.

References

Asolkar *et al.* (1992), Chatterjee and Pakrashi (1992), Chopra *et al.* (1956, 1969), Kirtikar *et al.* (1935), Sivarajan and Balachandran (1994), Yoganarasimhan (1996).

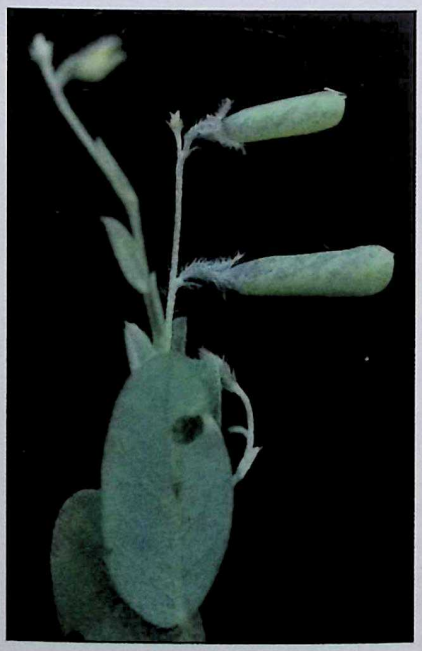
Crotalaria prostrata Rottl. ex Willd.

Common names

Bengali: chotajhunjhun, chotojhunghyn; ***Telegu***: serigallygista.

Description

A slender annual herb up to 40 cm high; stems prostrate or decumbent, clothed with silky yellowish hairs. Leaves subsessile, elliptic-lanceolate to ovate-oblong, 0.8–4 cm long and 0.3–2 cm wide, apex rounded or obtuse, base obliquely rounded to subcordate, both surfaces clothed with silky yellowish or yellowish-brown hairs, paler



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beneath; stipules absent. Flowers yellow, pedicelled, borne on 2–5-flowered, leaf-opposed racemes; peduncles slender, hairy, longer than the leaves; bracts and bracteoles minute; calyx 3–4 cm long, densely hairy, segments linear; corolla with a broadly oblong standard 2 mm wide. Fruit (pod) linear-oblong, inflated, 1.2–1.6 cm long, glabrous; seeds 12–20, polished.

Distribution and habitat

Found throughout the drier parts of South Asia and in Myanmar (Burma) and Java.

Medicinal properties and uses

The roots are used to treat stomach-ache and infantile diarrhoea among the Mundas and Santals. The leaf juice or the crushed leaves are applied to cuts to promote healing among the tribal inhabitants of eastern and southern Bihar.

References

Chopra *et al.* (1956), Girach and Aminuddin (1995), Jha and Varma (1996), Kirtikar *et al.* (1935).

Crotalaria spectabilis Roth.

Botanical synonyms

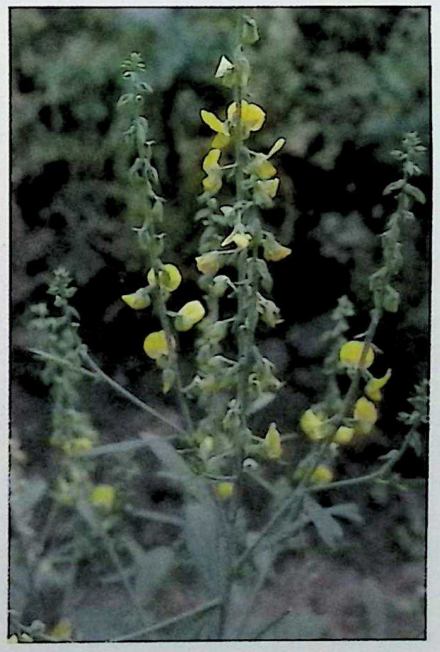
Crotalaria lescenaultii DC., *C. sericea* Retz.

Common names

Bengali: jhanjhania, pipulijhunjhun; ***Hindi***: jhunjhunia; ***Sanskrit***: ghantarava.

Description

An erect biennial undershrub up to 1.2 m tall with glabrous, furrowed branches. Leaves 5–15 cm long and variable in width, oblong-lanceolate, apex acute or subacute, mucronate, base cuneate, glabrous above, fine-silky beneath; petioles 1.6–3 mm long; stipules large, ovate-lanceolate, leafy, persistent. Flowers yellow with a purple tinge, borne in elongated 16–50-flowered terminal racemes 25–30 cm long; pedicels longer than the calyx with a large foliaceous ovate-acute bract at the base of each pedicel and a pair of minute bracts on each pedicel below the middle; calyx *c.* 1.3 cm long, tube campanulate, upper teeth large, triangular, acute, *c.* 6 mm broad at the base, the lower 3 teeth smaller and less deeply cut, linear-lanceolate, acute; corolla with a broadly ovate standard with a strong midrib at the back. Fruit (pod) stalked, linear-oblong, 2.5–5 cm long glabrous; seeds 20–30. Flowers between November and January and fruits from December to February in peninsular India.



Distribution and habitat

Native to the Indo-Malaysia region. Found in west-central and southern India, commonly along streambanks in deciduous forests.

Medicinal properties and uses

The plant is used to treat scabies and impetigo. Among the inhabitants of Bhadrak District in northeastern Orissa, the

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leaf juice is applied as an antiseptic for cuts and wounds. An extract of the twigs is reportedly used to treat children suffering from intestinal worms.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956, 1969), Girach *et al.* (1997), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

Cullen corylifolium (L.) Medikus

Botanical synonyms

Psoralea corylifolia L., *Trifolium unifolium* Forssk.

Common names

Bengali: bavachi, kakuch, latakasturi; ***English***: babchi; ***Gujarati***: babachi, babchi, bavchi; ***Hindi***: babchi, bavanchi, bukchi; ***Kannada***: baavanchi gida, bavanchi, karbekhiga; ***Malayalam***: karkokil, karpokkari, kaurkoalari; ***Marathi***: babachi, bavachya; ***Oriya***: bakuchi; ***Punjabi***: babchi; ***Sanskrit***: avalguja, bakuchi, bakuci, somaraji; ***Tamil***: karboka arisi, karpokarishi, karporgam, karpuga arisi; ***Telegu***: bavanchalu, bapunga, bhavanji; ***Urdu***: babchi.

Description

An erect, annual herb or undershrub, usually 0.6–1.2 m tall; stems and branches angular-ribbed, studded with conspicuous reddish glands and with a few appressed and spreading white hairs. Leaves alternate, simple (or sometimes trifoliate), 2.5–7.5 cm long and 2–5 cm wide, broadly elliptic, gland-dotted, apex obtuse to subacute, base subcordate to cuneate, margins serrate-dentate; main nerves 5, arising from the base; petioles 6–25 mm long, hairy and gland-dotted; stipules lanceolate, persistent. Flowers 0.5–0.6 cm long, pale lilac or yellow, borne in dense, 10–30-flowered, axillary racemes; peduncles 2.5–5.5 cm long, hairy; pedicels very short; calyx 3–4 mm long, hairy outside, the upper teeth linear-lanceolate, the lower ovate, twice as long as the upper; corolla nearly twice as long as the calyx, standard orbicular, 6 mm long, clawed, glabrous. Fruit (pod) small, to 5 mm long and 3 mm wide, ovoid-oblong, somewhat compressed, closely pitted, indehiscent, one-seeded; seed ovoid, dark brown to black, smooth, adhering to the pericarp. The seeds have a pungent odour when crushed, and a bitter taste. Flowers and fruits year-round.

Distribution and habitat

Native to tropical Asia from Arabia to Pakistan, India, Sri Lanka, Bangladesh, Myanmar (Burma) and southern China. In India it is a weed of roadsides, cultivated fields and waste places, growing during the rainy season.

Medicinal properties and uses

A paste or ointment made from the seeds is recommended as an external application for the treatment of elephantiasis, leucoderma, psoriasis and inflammatory diseases of the skin. In Ayurveda, the seed and seed oil are regarded as refrigerant, astringent, stomachic, alterative, diuretic, laxative, antipyretic,

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anthelmintic and alexiteric. They are an ingredient of many Ayurvedic compound preparations and are used to treat skin diseases, as noted above, as well as for asthma, diabetes, dysuria, anaemia, anorexia, rheumatism, constipation, piles and worm infestation. In Unani, the seeds are considered purgative, stomachic, anthelmintic, vulnerary, stimulant and aphrodisiac; they are used for treating leucoderma, biliousness and skin diseases. In Siddha, the seeds are used to treat glandular swellings, skin diseases, leprosy, and as a laxative, carminative, tonic and stimulant. The leaves are reportedly used to treat diarrhoea.

Warning

Oral administration of the powdered seeds usually results in nausea, vomiting or headache; external application of the essential oil preparations often causes skin irritation.

References

Chatterjee and Pakrashi (1992), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Jadeja (1999), Kirtikar *et al.* (1935), Sivarajan and Balachandran (1994), Yoganarasimhan (1996).

Dalbergia latifolia Roxb.

Botanical synonym

Dalbergia emarginata Roxb.

Common names

Bengali: sitsal, swetasal; ***English***: Bombay blackwood, Indian rosewood; ***Gujarati***: kalaruk, shissam; ***Hindi***: bilayatti shisham, saksal, satsal, shisham, sitsal; ***Kannada***: bide, bidi, bite, ibadi, todagatti; ***Konkani***: shisao; ***Malayalam***: cholavitti, itti, karitti; ***Marathi***: bhotheula, kalarukh, shisham, sisu, siswa; ***Oriya***: sissa, sissua; ***Punjabi***: shisham; ***Sanskrit***: krishna-sinsapa, shishapa, simsapa; ***Tamil***: eravadi, iruppottuthodagathi, itti, karundorviral, nukku, todagatti; ***Telegu***: cittegi, irugudu, jitangi, jittegi, virududuchava.

Description

A medium-sized to large deciduous tree with spreading branches, up to 40 m tall on deep, well-drained, moist alluvial soils in the southern Western Ghats, though usually much smaller. Leaves imparipinnate, 10–25 cm long; rachis straight, glabrous, extending beyond the uppermost pair of leaflets; leaflets 5–7, subcoriaceous, broadly ovate, 3.2–6.3 cm long and nearly as wide, apex rounded or emarginate, base cuneate, glabrous on both surfaces. Flowers greenish or yellowish-white to pale pink, borne in axillary or extra-axillary, lax panicles that are shorter than leaves; pedicels 1.6–3 mm long, filiform; bracts minute; bracteoles membranous; calyx 3–5 mm long, glabrous, teeth linear-oblong, obtuse, shorter than the tube; corolla 6 mm long, the petals with long claws. Fruit (pod) strap-shaped, glabrous. Flowers from August to October and fruits in January and February.

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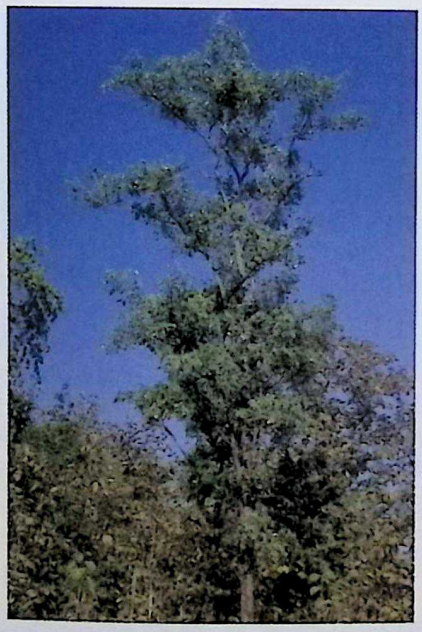
Distribution and habitat

Native to the Indo-Malaysia region from India to Java. Usually found scattered in mixed deciduous forests, often associated with teak (*Tectona grandis*: *Verbenaceae*) in the sub-Himalayan hills from central Uttar Pradesh eastwards, in Bihar, Orissa, and in western, central and southern India. In Karnataka, frequent in moist deciduous to semi-evergreen forests of the Western Ghats and interior districts. Often cultivated for its valuable timber in India and in mainland Southeast Asia, Java and parts of tropical Africa.



Medicinal properties and uses

The plant is considered bitter, tonic and stomachic, and is used to treat dyspepsia, diarrhoea, leprosy, obesity and worms. The bark, pounded with that of *Dalbergia paniculata*, is applied externally to relieve body pain. In Ayurvedic practice, the root, bark and leaves are used as substitutes for those of *Dalbergia sissoo* to treat polyuria, chronic ulcer, leprosy, leucoderma, urinary bladder disorders, burning sensation, oedema, and as a brain tonic.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

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Dalbergia paniculata Roxb.

Common names

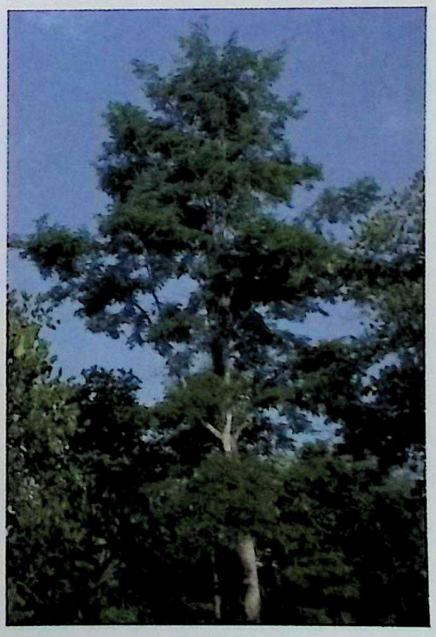
Gujarati: padri; ***Hindi***: dhobein, passi, satpura; ***Kannada***: bilugadmara, gunniri, hassurugunni, pachari; ***Malayalam***: ottutholi, pachariai, paingani, velittha-vitti, vetiatholi, vettatholi; ***Marathi***: phansa, sheodur, sondara, taple; ***Oriya***: barahbakala, dhupi, sojapaniapati-tinia; ***Tamil***: adukkuvagia, painganni, pannivagei, porapatchalia; ***Telegu***: pachari, patsaru, porlopachari, potrumporilla, sopera, toper.

Description

A medium-sized to large, straight-stemmed, deciduous tree with smooth, greenish-white bark; young branches clothed with greyish-brown pubescence. Leaves alternate, imparipinnate, 10–15 cm long; rachis glabrous; leaflets 9–13, rigidly subcoriaceous, 1.8–2.5 cm long and 0.9–1.8 cm wide, obovate, oblong or elliptic, obtuse, emarginate, glabrous, turning black on drying. Flowers bluish-white, borne in numerous terminal panicles, the branches clothed with reddish-brown pubescence; bracts oblong, hairy, caducous. Fruit (pod) flat, 3.7–6.3 cm long and 1.2–1.8 cm wide, narrowed at both ends, long-stalked, reticulately veined, 1–2-seeded, turning black on the tree on maturity. In central Indian deciduous forests, flowering occurs mainly from April to July and fruiting from November to January; in this region trees remain leafless between February–March and June.

Distribution and habitat

Common throughout western, central and southern India, and in Myanmar (Burma), in dry deciduous forests up to about 450 m elevation.



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Medicinal properties and uses

In southern Madhya Pradesh (Bastar) the water extract of the root is given to children to relieve diarrhoea.

References

Asolkar *et al.* (1992), Hemadri and Rao (1989).

Dalbergia sissoo Roxb.

Common names

Bengali: shisu, sisu; ***English***: shisham, sissoo; ***Gujarati***: sisam, sissom, tanach; ***Hindi***: shisham, sissai, sissu; ***Kannada***: agaru, biridi, irukutimaru, shishambage, shistabage; ***Konkani***: sisso, sissu; ***Malayalam***: iruvil; ***Marathi***: sissu, sisu; ***Oriya***: padimi, simsapa, sissu, sissua; ***Punjabi***: nelkar, shewa, shishai, shisham, sihon, tahli; ***Sanskrit***: shingshupa, simsapa; ***Tamil***: gette, mukkogette, sisu itti; ***Telegu***: errasissu, karra, sinsupa, sissu, sissukarra; ***Urdu***: shisham.

Description

A small to medium-sized deciduous tree, often with a crooked trunk and light crown, reaching a maximum height of 30 m on well-drained, porous, alluvial soils, but more commonly less than 20 m tall. Leaves imparipinnate, 8 cm long; leaf rachis zigzag; stipules lanceolate, caducous; leaflets 3–5, glabrous, coriaceous, alternate on rachis, 3.8–6.3 cm long and 3–5.4 cm wide, obovate-suborbicular, apex abruptly acuminate, base narrowed or cuneate, petiolules 3–6 mm long. Flowers pale yellow, borne in axillary panicles composed of several short spikes, rachis and branches of the panicle densely hairy; calyx 4–5 mm long, hairy, teeth short, ciliate; corolla 6–8 mm long, standard 4 mm broad with a long claw, the limb obovate-orbicular. Fruits (pods) 3.8–10 cm long and 0.6–1.3 cm wide, narrowed at the base into a long stalk, thin, strap-shaped, glabrous, pale grey when mature; seeds 1–4. In central India flowering occurs mainly in March and April and fruiting from May onwards, the pods remaining on the tree until the following flowering season.

Distribution and habitat

Native to western and southern Asia from Iraq to northern India; common in the sub-Himalayan hills from Punjab to Assam to an elevation of about 1500 m, growing gregariously in alluvial forests characteristic of the river beds of this region. Extensively cultivated for its extremely hard timber in

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Punjab, Uttar Pradesh, West Bengal and Assam (as well as in other tropical countries), and throughout India mainly as a roadside tree. Occasionally naturalized in deciduous forests outside its north Indian range, as in dry forests of interior Karnataka.

Medicinal properties and uses

In Ayurveda the bark and wood are considered abortifacient, expectorant, anthelmintic, antipyretic and useful for treating ulcers, blood diseases, leucoderma, dyspepsia and dysentery. The bark is alterative and haemostatic, and used for treating bleeding piles, menorrhagia and varicose veins. The oil derived from the wood is applied externally to treat skin diseases. In Unani practice the wood is used to treat scabies, burning sensations of the body, syphilis and stomach troubles. The leaves are bitter and stimulant; their decoction is said to be useful in the treatment of gonorrhoea. The leaf mucilage, mixed with sweet oil, is applied to excoriations. In Ayurveda the juice of the leaves is used for treating eye diseases.

References

Asolkar *et al.* (1992), Chatterjee and Pakrashi (1992), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

Derris indica (Lam.) Bennet

Botanical synonyms

Galedupa indica Lam., *Pongamia glabra* Vent., *P. pinnata* (L.) Pierre.

Common names

Bengali: dahur karanja, dalkaramcha, karanj, karanja, kerum; ***English***: Indian beech, karanj, pongam oil tree; ***Gujarati***: kanai, karangi, karanj, karanja; ***Hindi***: kanji, karanj, karanja, karanji, papar kanji; ***Kannada***: batti, honge, huligili, karanja, uggemara; ***Konkani***: kerongi, korongi; ***Malayalam***: minnari, pongu, ponnam, pungu, punnu, unju, unnu; ***Marathi***: ghanerakaranj, karanj, karanja, karanji; ***Oriya***: konja, koronjo; ***Punjabi***: karanj, paphri, sukhchain; ***Sanskrit***: karanja, karanjah, naktamala; ***Tamil***: agirunanandam, kanjanam, ponga, pongam, punga, pungam, pungu; ***Telegu***: gaanuga, kagukaranuga, kanuga, kranuga, pungu; ***Urdu***: karanjwah.

Description

A medium-sized, semi-evergreen tree up to 18 m tall with a short bole and spreading crown; bark greyish-green or brown, smooth or covered with tubercles. Leaves alternate, imparipinnate, 5–9 foliate, dark green, shining; leaflets opposite, ovate to elliptic,

shortly acuminate, glabrous, to 15 cm long and 8 cm broad. Flowers small, lilac or white tinged with pink or violet, fragrant, borne in fascicles of 2–4 flowers in axillary racemes to 15 cm long; calyx campanulate, truncate; corolla much exserted, standard suborbicular with curved folds above the claw, wings obliquely oblong. Fruit (pod) compressed, woody, glabrous, indehiscent, yellowish-grey when mature, varying in size and shape, elliptic to obliquely oblong, to 7.5 cm long

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and 3.5 cm wide, with a curved beak, usually 1-seeded; seed elliptical or kidney-shaped, to 2 cm long and 1.8 cm wide, wrinkled, reddish-brown. Depending on locality, flowering occurs between March and June; fruits mature between February and April.

Distribution and habitat

A widely distributed palaeotropical species, common throughout India, but considered native only to the Western Ghats. Found chiefly along stream- and riverbanks, or near the sea coast in tidal and beach forests. Often planted along roadsides as an avenue tree throughout most of India to an elevation of 1200 m.

Medicinal properties and uses

The seed oil, whose active principle has been identified as karanjin, is highly valued in traditional Indian medicine. It is considered anthelmintic and styptic and is used externally in the treatment of chronic fevers, rheumatism, lumbago, herpes, scabies, leucoderma and other skin diseases. The seed oil also possesses insecticidal, piscicidal and antibacterial properties, and is sometimes used as a lamp oil in villages. Among the Irulars of Tamilnadu a paste prepared from the ground seeds is applied externally to knee and hip joints to relieve rheumatic pain. The juice of the leaves is used to treat flatulence, dyspepsia, diarrhoea and cough; it is also considered a remedy for leprosy and gonorrhoea. A hot infusion of the leaves is used as a medicated bath to relieve rheumatic pains and for cleaning ulcers and sores. A paste of the leaves is applied on the head to heal ulcers and cure dandruff in northeastern Karnataka. Among the rural and tribal inhabitants of Bhavnagar District and the Barda Hills in Gujarat the crushed leaves or leaf paste is used as an external application to relieve haemorrhoids and eczema; in the former region the young twigs are used as a toothbrush for relief of toothache. The flowers are considered a remedy for diabetes. The juice of the roots is also used for cleaning sores, as well as for cleaning teeth and strengthening gums; mixed with equal quantities of coconut milk and

lime water, it is sometimes given internally for the treatment of gonorrhoea. A paste of the roots is used as an external application to treat scrofulous swellings. The stem bark is reportedly used in some locales to treat bleeding piles, and its decoction is given for beri-beri and, among the tribal inhabitants of southern Bihar, for post-partum recovery.

References

Asolkar *et al.* (1992), Bhatt and Mitaliya (1999), Chatterjee and Pakrashi (1992), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Girach and Aminuddin (1995), Jadeja (1999), Kirtikar *et al.* (1935), Ragupathy and Mahadevan (1991), Ravisankar and Henry (1992), Seetharam *et al.* (1999), Sivarajan and Balachandran (1994).

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Desmodium gangeticum (L.) DC.

Botanical synonyms

Desmodium gangeticum var. *maculatum* (L.) Baker, *D. maculatum* (L.) DC., *Hedysarum gangeticum* L., *H. maculatum* L., *Meibomia gangetica* (L.) Kuntze

Common names

Bengali: salpani; ***Gujarati***: salwan; ***Hindi***: salpan, salparni, salwan, sarivan; ***Kannada***: kulakunaaru, mutelehonne, saleparni; ***Malayalam***: orila, pullati; ***Marathi***: darh, ranbhal, salparni, salwan; ***Oriya***: salopornni; ***Punjabi***: shalpurhi; ***Sanskrit***: amsumati, prshniparni, salaparni, saliparni, shalaparni, vidarigandha; ***Tamil***: pulladi; ***Telegu***: gitanaram, kolakuporna, nallenelapariki, peddantrinta; ***Urdu***: shalwan.

Description

A common undershrub usually 0.6–1.2 m tall with a simple, straight stem and irregularly angled, densely hairy branches. Leaves unifoliate, petioles 1–2 cm long; stipules scarious, 6–8 mm long; leaflets membranous, broadly elliptic to ovate or sometimes lanceolate, 9–12.5 cm long and 3.5–6.3 cm wide (occasionally larger), base rounded or acute, apex acute or acuminate, margins somewhat wavy, usually glabrescent on upper surface, pale green and clothed with soft whitish appressed hairs beneath, main nerves 8–12 pairs. Flowers violet or white, borne in fascicles of 2–5 flowers in lax, 40–60-flowered, terminal and axillary racemes 15–30 cm long; pedicels 4–6 mm long, filiform, pubescent; bracts subulate, 1.5–3 mm long; calyx 2 mm long, hairy, broadly campanulate, 4-lobed, teeth triangular, longer than the tube; corolla 3–4 mm long, standard broadly obovate, *c.* 3 mm long and wide, cuneate at the base, wings 3.5–4 mm long. Fruit (pod) linear to slightly curved, 1.2–2 cm long and 2 mm wide, lower suture deeply indented; joints 4–8, reticulate, longer than broad, indehiscent, sparsely clothed with minute hooked hairs. In central India, flowering occurs between July and October and sometimes again in January–February; fruiting occurs mainly from September to December.

Distribution and habitat

Broadly distributed from tropical Africa through tropical Asia to Malesia and northern Australia; introduced and naturalized in the West Indies. Found throughout India except in the driest regions in forests and open habitats, up to 1600 m in the Himalayas.

Medicinal properties and uses

In Ayurveda, the astringent roots are considered a good cardiotonic and are used to treat cardiac disorders; they are also considered diuretic, febrifuge, expectorant, laxative and a nervine tonic and are used to treat intermittent fever, cough, difficult breathing, diarrhoea, dysentery and vomiting. The roots are also an ingredient of the well-known Ayurvedic preparation, *Dasamula kwatha,* used in postnatal care to avoid secondary complications. The tribal inhabitants of Sundargarh District in Orissa reportedly use the decoction of the roots and seeds as a febrifuge and anticatarrhal.

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The root juice is used to check vomiting and in the treatment of dysentery among the tribal inhabitants of eastern Bihar. Among the Santhalis in southern Bihar, pills prepared from the root along with the root of *Piper betle* (*Piperaceae*) are reportedly taken by women to promote sterility.

References

Asolkar *et al.* (1992), Chatterjee and Pakrashi (1992), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Jha and Varma (1996), Kirtikar *et al.* (1935), Mukherjee and Namhata (1990), Sivarajan and Balachandran (1994), Varma (1997), Yoganarasimhan (1996).

Desmodium laxiflorum DC.

Botanical synonyms

Desmodium diffusum DC. non (Willd) DC., *D. recurvatum* (Roxb.) Graham ex Wight & Arn., *Hedysarum diffusum* Roxb., *H. recurvatum* Roxb.

Common names

Kannada: otte; ***Sanskrit***: prshniparni.

Description

An erect herb or undershrub up to 1.2 m tall, with quadrangular, appressed-pubescent branches. Leaves alternate, trifoliate; leaflets ovate-elliptic, apex acute to acuminate, silky-pubescent beneath, membranous, to 14 cm long and 8 cm wide. Flowers 2–5 per bract, borne on 25–40-cm-long racemes; standard white, other petals blue, both covered with yellowish-white hairs. Fruits (pods) linear with straight sutures, 2.5–3.8 cm long and less than half as wide, joints 6–10, with hooked hairs. Flowers and fruits September–November in Karnataka.

Distribution and habitat

Native to the Indo-Malaysia region. Found throughout peninsular India to an altitude of 900 m, and in northern India to 1300 m, typically in valleys and shaded forest habitats.

Medicinal properties and uses

The plant is used as a substitute for *D. gangeticum* in some parts of Kerala as a cardiotonic and for treatment of heart disorders, fever, cough, breathing difficulties, dysentery, thirst and vomiting.

References

Asolkar *et al.* (1992), Sivarajan and Balachandran (1994).

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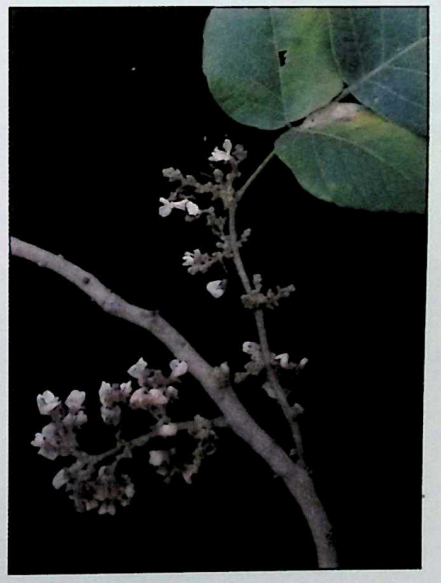
Desmodium oogeinense (Roxb.) Ohashi

Botanical synonyms

Dalbergia oogeinensis Roxb., *Ougeinia dalbergioides* Benth., *O. oojeinensis* (Roxb.) Hochr.

Common names

Bengali: tinis; ***English***: chariot tree, sandan; ***Gujarati***: bhinoharmo, harmo, tanach, tanase; ***Hindi***: asaindi, panan, panjan, sandan, tinas, tinsa; ***Kannada***: bettahonne, kalmuthuga, kari honne, kuri mutal; ***Konkani***: kurimutal; ***Malayalam***: malavenna, nemi; ***Marathi***: kalapalas, kalaphulas, tanach, tewas, tiwas; ***Oriya***: bandhona, banjan; ***Punjabi***: sandan, sannan, telus; ***Sanskrit***: rathadru, tinisa, tinisah; ***Tamil***: kullu vengai, nai, narivengai; ***Telegu***: adavishikkudu, chikkudu, dargu, tella motuku, tinisavriksha, vandanam.



Description

A small deciduous tree up to 12 m tall with grey or dark brown, deeply cracked bark. Leaves alternate, trifoliate, to 30 cm long (including the petiole); petioles 3.8–5 cm long; stipules 6 mm long, lanceolate, acute; leaflets broadly ovate, 7.5–15 cm long and 3.8–10 cm wide, coriaceous, glabrous above, sparsely pubescent beneath, base cordate, margins shallowly crenate, main nerves 4–8 pairs, petiolules 3 mm long. Flowers white or pink, somewhat fragrant, borne in short-fascicled racemes arising from the nodes of old branches; pedicels 1.2–2 cm long, filiform; bracts *c.* 1.3 mm long, ovate, acuminate; bracteole 1 beneath the calyx, minute; calyx 4–6 mm long, pubescent, teeth short, triangular; corolla 1–1.3 cm long. Fruits (pods) linear-oblong, 5–7.5 cm long, light brown, flat, joints 2–3 times as long as broad, reticulately veined; seeds 2–5. In central Indian deciduous forests flowering occurs from February to April and fruiting from April to June; in this region trees remain leafless between January–February and April.

Distribution and habitat

Common, sometimes almost gregarious, in dry and mixed deciduous hill forests and in sal (*Shorea robusta*)-dominated forests to an altitude of 1500 m from the outer Himalayas and sub-Himalayas in northern India, southwards through most of peninsular India. It grows on a wide range of soils, with its best growth occurring on

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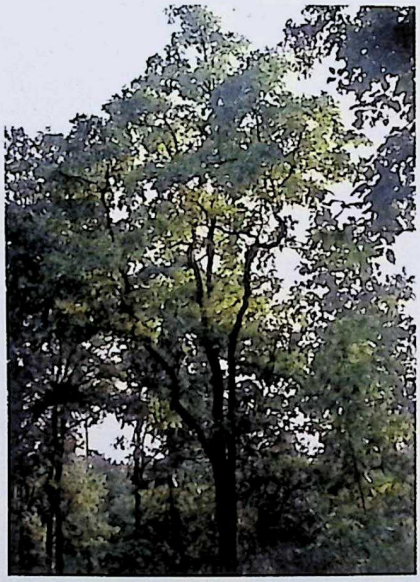
alluvial loams. It is particularly common on riverbanks, landslips and other exposed sites. Occasionally planted in gardens.



Medicinal properties and uses

In Ayurveda the bark is considered anthelmintic and astringent to the bowels; it is used to treat dysentery, worm infestations, leucoderma, urinary discharges, ulcers and wounds, blood disorders, skin diseases and biliousness. It is also used as a febrifuge, vermifuge and fish poison. The sap exuded from the cut bark is used to treat diarrhoea and dysentery. A decoction of the bark is used as a fomentation to treat boils and relieve body swellings among the tribal inhabitants of Madhya Pradesh. Among the Gonds of Uttar Pradesh, an aqueous extract of the root is given for 2 months for treating menstrual disorders, and the stem bark juice is used as an eye-drop for treating cataracts; mixed with buttermilk, it is used as a treatment for diarrhoea.

References

Chatterjee and Pakrashi (1992), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935), Shah and Singh (1990), Singh and Prakash (1994), Yoganarasimhan (1996).

Desmodium triflorum DC.

Botanical synonyms

Hedysarum stipulaceum Burm. f., *H. triflorum* (L.) DC., *Meibomia triflora* (L.) Kuntze

Common names

Bengali: kodalia, kukaliya; ***Gujarati***: jhinopanddhio; ***Hindi***: kudaliya; ***Kannada***: kadu pullam purasi; ***Malayalam***: nilamparanta; ***Marathi***: janglimethi, ranmethi; ***Sanskrit***: hamsapadi, tripadi; ***Tamil***: sirupulladi; ***Telegu***: muntamandu, munuddamoddu.

Description

A wiry, spreading, perennial herb with a radial growth habit, often rooting at basal nodes; stems up to 0.5 m long, sparsely pilose. Leaves alternate, trifoliate; petioles 1.5–8 mm long; stipules ovate, 2.5–3.5 mm long; subequal, leaflets obcordate, emarginate at apex, cuneate at base, margins entire, upper surface glabrous, lower with sparse appressed hairs; terminal leaflet 4–9 mm long and 3–10 mm wide, lateral leaflets smaller (*c.* 3–8 mm long and wide). Inflorescence sessile, leaf-opposed fascicles

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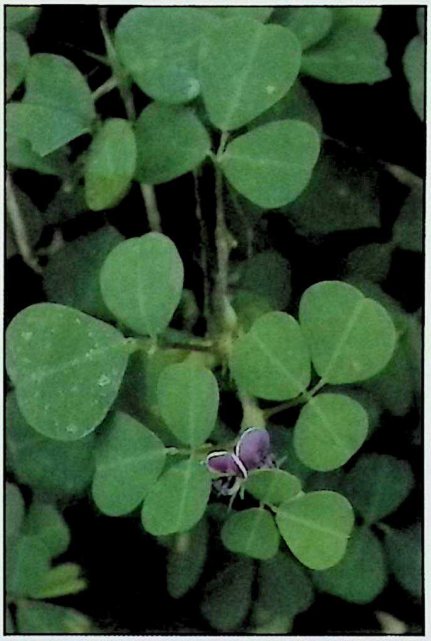
of 2–4 flowers; primary bracts narrowly ovate, acuminate, *c.* 4 mm long; pedicels 5–8 mm long; calyx 5-lobed, lobes 1.5–2 mm long; corolla purplish or bluish, standard obovate, rounded at apex, about 3 mm long and 1.8 mm wide; wings about 2.5 mm long; keel petals longer than the wings. Fruit (pod) linear or oblong, 1–1.5 cm long, continuous along upper suture, indented on lower suture, with 4–5 reticulate joints, 3–5-seeded. Flowers and fruits between August and November in western Maharashtra.



Distribution and habitat

Pantropical in distribution. In India it is a common weed of open habitats in all plains districts, up to 900 m elevation in the hills of peninsular India and to 2000 m in the Himalayas.

Medicinal properties and uses

In Ayurvedic medicine, the fresh leaves (or their juice) are applied externally to relieve burns and to promote healing of wounds and abscesses. They are also used internally as a galactagogue, and are reportedly effective for treating dysentery, poisonous affections and skin diseases. The leaves, ground with cow's milk, are given to children for diarrhoea due to indigestion and also in convulsions. Among tribal women in western Maharashtra the juice of the fresh plant is taken to check bleeding during pregnancy. The roots are considered carminative, tonic, diuretic, and are used to treat bilious complaints and diarrhoea, and as a galactagogue.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Sivarajan and Balachandran (1994), Upadhye *et al.* (1994), Yoganarasimhan (1996).

Desmodium velutinum (Willd.) DC.

Botanical synonyms

Desmodium lasiocarpum DC., *D. latifolium* (Roxb. ex Ker) DC., *Hedysarum lasiocarpum* Beauv., *H. velutinum* Willd.

Common names

Oriya: ronodalo, sedutnla; ***Sanskrit***: prshniparni; ***Tamil***: anguchabadi, chimbattai, chinanduri, chithamalli, chivamadu, kubayam, kuchattinbadi; ***Telegu***: adiviyantinta, gaba, magalinga, tellanelapariki.

Description

An erect herb or undershrub 0.6–1.2 m tall; branches terete, densely clothed with long spreading brownish hairs. Leaves unifoliate; petioles 0.8–2 cm long; stipules striate with a broad base and acuminate apex, 3–7 mm long; leaflet 6.3–7.5 cm long, broadly ovate, apex obtuse or acute, base truncate or shallowly cordate, margins repand, pubescent above, densely velvety beneath. Inflorescences terminal and axillary, 5–30 cm long, composed of 2–4-flowered fascicles;

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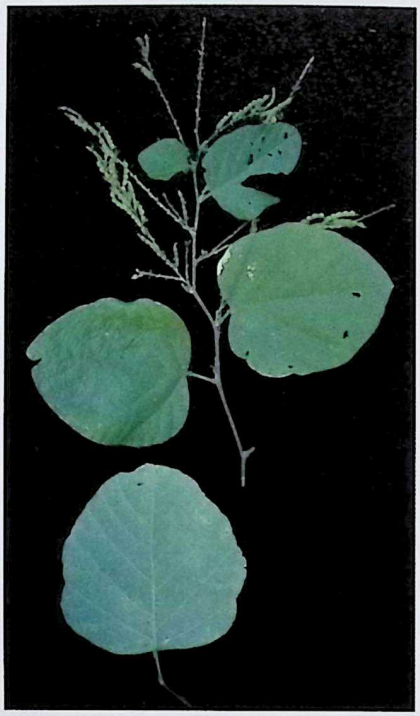
calyx broadly campanulate, 4-lobed, densely pubescent, the tube 0.8–1 mm long, calyx lobes equal in length to the tube except for the lower one (to 1.5 mm long); corolla blue, pink or purplish, standard obovate, obtuse at apex, about 5 mm long, wings and keel petals about as long. Fruit (pod) flat, straight, up to 2 cm long and 2.5–3 mm wide, 4–7-jointed, covered with hooked hairs, upper suture nearly straight, lower suture indented; seeds minute, 1.8–2.4 mm long and 1–2 mm wide. In central India flowering occurs mainly between August and October and fruiting from September to December; the leaves frequently turn red before falling in December and January.



Distribution and habitat

Widely distributed in the Old World tropics. Found throughout most of India except in the driest regions, to an elevation of 1200 m, typically in open habitats or in deciduous forests.

Medicinal properties and uses

Among the Kathodias of Rajasthan, the crushed root is reportedly given to infants as a remedy for inability to digest mother's milk. In northern Orissa, the powdered root is used as a remedy for diarrhoea among the Paudi Bhuinya. The plant is used as a substitute for *Desmodium gangeticum* in some parts of Kerala as a cardiotonic and for treatment of cardiac disorders, fever, cough, breathing difficulties, dysentery, thirst and vomiting.

References

Aminuddin and Girach (1996), Asolkar *et al.* (1992), Chopra *et al.* (1956), Joshi (1989), Kirtikar *et al.* (1935), Sivarajan and Balachandran (1994).

Flemingia strobulifera (L.) Roxb.

Botanical synonyms

Hedysarum bracteatum Roxb., *H. strobulifera* L., *Moghania strobulifera* (L.) St. Hil. ex Kuntze

Common names

Hindi: kusrunt; ***Kannada***: kanputhi, kumalu, kumbilteri; ***Malayalam***: kumalu, kumbilteri; ***Marathi***: bundar, kanphuti; ***Telegu***: nallabaddu.

Description

A much-branched, scandent, evergreen shrub up to 3.5 m tall with terete branches; young branchlets pubescent. Leaves unifoliate; petioles 0.5–2.5 cm long, pubescent; stipules lanceolate, 6–8 mm long, caducous; leaflets subcoriaceous, minutely gland-dotted, ovate, elliptic to broadly lanceolate, 9–14 cm long and 4–5 cm wide, apex acute or acuminate, base broadly cuneate, rounded or somewhat cordate, green and glabrous

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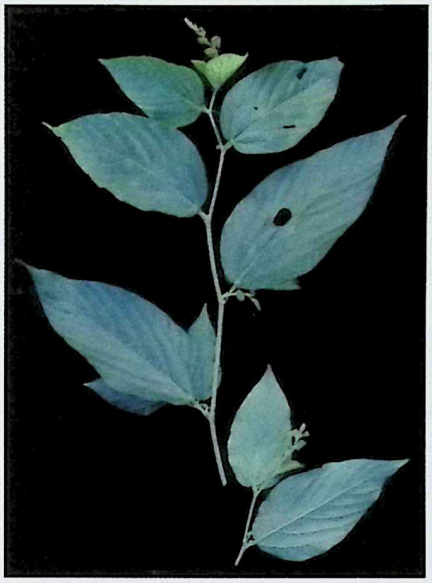
above, paler and finely silky-pubescent beneath, with 6–9 pairs of prominent parallel veins. Flowers borne in axillary and terminal simple or branched racemes 7.5–15 cm long, closely arranged along a pubescent zig-zag rachis; bracts large, membranous, persistent, broadly orbicular-ovate, shortly acuminate, 1.3–2.5 cm long, cordate at the base, conspicuously nerved and reticulately veined, stalked, each bract folded over and enclosing 2 or more small flowers; calyx 6 mm long, pubescent, teeth linear, acute, veined, longer than the calyx tube; corolla white or purple, 1 cm long, standard 8 mm broad, auricled, wings shorter than keel. Fruits (pods) oblong, *c.* 10 mm long and 5 mm wide, densely pubescent, turgid, mucronate, 1–2-seeded; seeds 2–4 mm long and 2 mm wide, mottled. Flowers and fruits between December and April in central Indian deciduous forest regions, and from November to March in southern India.

Distribution and habitat

Native to the Indo-Malaysia region from India eastwards to the Philippines, Malaysia and New Guinea; introduced and naturalized in Micronesia, Polynesia and the West Indies. In India it is found almost throughout the country to an altitude of 1400 m in northern India and to 900 m in the Eastern and Western Ghats, typically in moist, shaded forest habitats and along streams. It is occasionally grown in gardens as an ornamental plant.



Medicinal properties and uses

The roots of the plant are used by the Santhalis to treat epilepsy and hysteria, and to induce sleep and relieve pain. The powdered root is given to relieve constipation among the tribal inhabitants of southern Bihar; among the Paudi Bhuinya in northern Orissa, however, a decoction of the root is given in small doses as a cooling tonic for treating diarrhoea.

References

Aminuddin and Girach (1996), Asolkar *et al.* (1992), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Girach and Aminuddin (1995), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

Indigofera cassioides Rottb. ex DC.

Botanical synonyms

Indigofera leptostachys DC., *I. pulchella* sensu Baker

Common names

Hindi: ghirghol, hakna, nil, sakena; ***Kannada***: gogge; ***Malayalam***: manali; ***Marathi***: baroli, chirmati, nirda; ***Oriya***: girili; ***Tamil***: narinji; ***Telegu***: siralli, vuyye.

Description

A deciduous, grey-pubescent shrub up to 2 m tall; branches striate, glabrous or more or less hairy. Leaves 7.5–15 cm long; petioles 1.9–2.2 cm long; stipules very minute; leaflets opposite or sometimes alternate, elliptic-oblong, 1.2–2.5 cm long and 0.8–1.5 cm wide, apex rounded, truncate or emarginate, apiculate, base acute, thinly hairy, pale green above and glaucous

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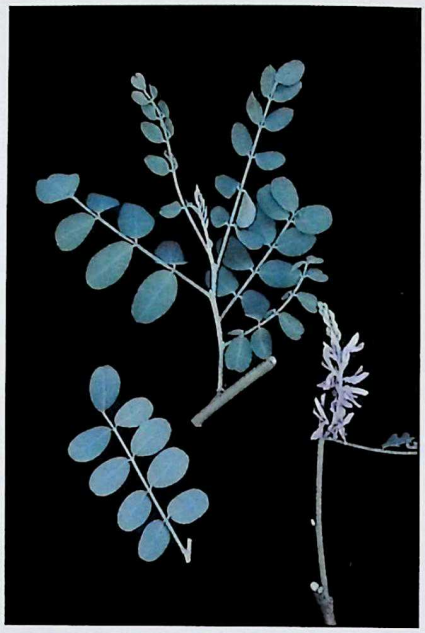
below, petiolules of lateral leaflets 2–3 mm long, those of terminal leaflets 6–9 mm. Flowers the largest of the genus, pinkish to purple or bright red, borne on 15–20-flowered short-peduncled racemes 10–20 cm long; pedicels short, slender, hairy; bracts large, boat-shaped, long-cuspidate, silky-hairy; calyx 2–3 mm long, appressedly hairy outside, teeth short, triangular; corolla 1.2–2 cm long, standard orbicular, as broad as long, keel petals glabrous outside. Fruit (pod) 2.5–4.5 cm long, straight, cylindrical, turgid, with broad sutures, 8–12-seeded. Flowers and fruits from October to April in Karnataka.



Distribution and habitat

Found in moist evergreen forests throughout the Himalayan tract and on hills up to 1500 m in peninsular India.

Medicinal properties and uses

A decoction of the root is used by the Santhalis to treat cough, and the powdered root is applied externally to relieve chest pains. Among the tribal inhabitants of southern Bihar, the roots are ground with equal proportions of those of *Andrographis paniculata* (*Acanthaceae*) and *Smilax* spp. (*Smilacaceae*) and given for treatment of haematuria.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956), CSIR (1948–1992), Girach and Aminuddin (1995), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

Indigofera glandulosa Roxb. ex Willd.

Common names

Gujarati: vekhariyo; ***Marathi***: barbada, bargadan; ***Tamil***: barapatam; ***Telegu***: baragadam, barapatalu, barapatam, boomidapu.

Description

A small, erect, much-branched annual herb up to 50 cm tall, hairy when young; branches long, slender, clothed with spreading hairs when young. Leaves trifoliate, leaf rachis to 1.2 cm long; leaflets 1.2–2.5 cm long and 0.6–1.2 cm wide, oblanceolate, apex rounded or slightly retuse, apiculate, green with a few appressed hairs above, glaucous, appressedly hairy with black gland-dots beneath, petiolules of lateral leaflets 1.2–1.5 mm long, those of terminal leaflets longer. Flowers small, red to pink, borne in short axillary, sessile, 5–7-flowered heads 6–10 mm long; calyx 2–2.5 mm long, hairy outside, teeth long; corolla 2–3 times as long as the calyx. Fruits (pods) 0.5 cm long, finely pubescent, angled, the angles slightly winged and often toothed; seeds 1–2, spherical, smooth and polished, sometimes mottled. Flowers and fruits from September to February in peninsular India.

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Distribution and habitat

Occurs naturally in West Africa and in the Indo-Malaysia region. Found as a common weed on dry and sandy soils in Uttar Pradesh, Bihar, Gujarat and the plains of central India southwards to northern Karnataka and Andhra Pradesh.

Medicinal properties and uses

The seeds are highly nutritious and reportedly have tonic properties.

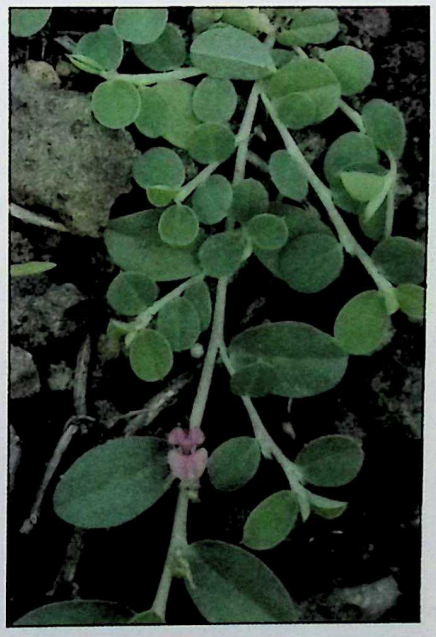
References

Asolkar *et al.* (1992), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Nadkarni (1954).

Indigofera linifolia (L. f.) Retz.

Botanical synonyms

Hedysarum linifolium L. f., *Sphaeridiophorum linifolium* (L. f.) Desv.



Common names

Bengali: bhangra; ***Gujarati***: jhinkigali, nahanigali; ***Hindi***: torki; ***Marathi***: bhangra, burbur, torki; ***Punjabi***: torki.

Description

A slender, trailing or procumbent, annual herb; stems numerous, much-branched, to 45 cm long, stems and leaves covered by silvery pubescence; stipules subulate, 3–5 mm long. There are 2 varieties: var. *linifolia*, with a cyclindrical stem, linear leaves to 3 cm long and 0.4 cm wide, long internodes, and 6–8-flowered racemes; and var. *campbelli* Wight ex Baker (pictured here), with a 2-edged stem, obovate, acute leaves to 1 cm long and 0.4 cm wide, short internodes, and 1–4-flowered racemes. Flowers deep pink to bright red, 5–8 mm long, borne in subsessile racemes; calyx 2.5 mm long, very deeply cut, clothed with silvery hairs, teeth linear, subulate, many times longer than the tube; corolla 2–3 times as long as the calyx. Fruit (pod) 1.5–2 mm long, globose, hard, silvery pubescent, apiculate, 1-seeded. Flowers and fruits almost throughout the year.

Distribution and habitat

Widely distributed in the Old World tropics from Sudan and Ethiopia eastwards

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through the Indian subcontinent to Malesia, China and tropical Australia. Found throughout the plains of India.

Medicinal properties and uses

The plant is used to treat febrile eruptions. The Santhalis use the plant, along with *Euphorbia thymifolia* (*Euphorbiaceae*), to treat amenorrhoea. It is also considered to have vermifugal properties. Among the tribal inhabitants of eastern Bihar, a paste of the plant is applied externally to promote healing of bone fractures, and the root paste is applied to treat scorpion bite.

References

Asolkar *et al.* (1992), Chatterjee and Pakrashi (1992), Chopra *et al.* (1956), CSIR (1948–1992), Jha and Varma (1996), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

Indigofera linnaei Ali

Botanical synonyms

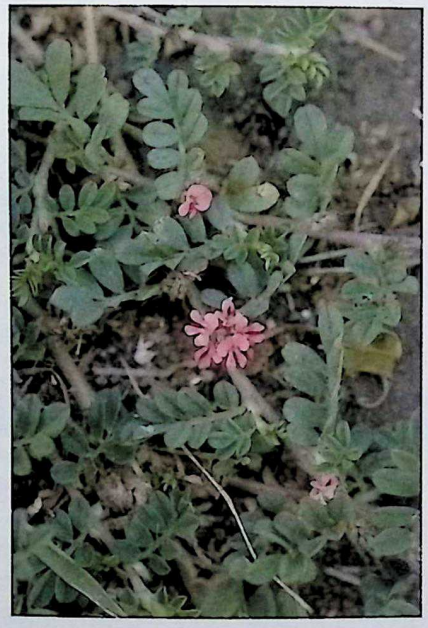
Hedysarum prostratum L., *Indigofera caespitosa* Wight, *I. enneaphylla* L., *I. prostrata* (Burm. f.) Domin.

Common names

Gujarati: bhonyagali; ***Hindi***: latahai; ***Kannada***: kannegilu, kenneggilu; ***Malayalam***: cherupullate; ***Marathi***: bhingule, bhuiguli; ***Sanskrit***: vasuka; ***Tamil***: cheppunerunji, sheppunerunji; ***Telegu***: chalapachhi, cherragaddamu, sheragaddam, yerrepalleru.

Description

A small, trailing, much-branched, grey-pubescent annual or perennial herb with a woody rootstock; branches 30–45 cm long. Leaves nearly sessile, imparipinnate, rachis 1.5–2 cm long; leaflets usually 7–9, alternate, subsessile, oblong-ovate, 3–12 mm long and 1.5–5 mm wide, obtuse or emarginate at apex, cuneate at base, appressedly white pubescent on both surfaces; stipules scarious, 5–6.5 mm long, ovate, long-cuspidate. Flowers small, borne in sessile or short-peduncled 10–20-flowered axillary spikes up to 1.5 cm long; calyx 3–4 mm long, hairy outside, teeth long, setaceous; corolla bright red, slightly exserted. Fruits (pods) 3–4 mm long and 1.5–2 mm in diameter, oblong, cyclindrical, more or less clothed with white appressed hairs; seeds 2, globose.



Distribution and habitat

Native to tropical Africa and the Indo-Malaysian region. Found throughout India in the plains and up to 1300 m in the Himalayas, usually in dry, barren habitats.

Medicinal properties and uses

The juice of the plant is reported to be anti-scorbutic, diuretic and alterative, and is used to treat chronic venereal disease; in Rajasthan it is reportedly used as an eye-drop as a remedy for migraine. A decoction of the whole plant is used to treat epilepsy

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and insanity. Among tribal women of Prakasam District in southern Andhra Pradesh, the whole plant, mixed with garlic, is used as an oral contraceptive believed to induce permanent sterility. The plant is boiled in oil and applied to relieve burns.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Joshi (1989), Kirtikar *et al.* (1935), Vijaya Kumar and Pullaiah (1998), Yoganarasimhan (1996).

Milletia extensa Benth. ex Baker

Botanical synonyms

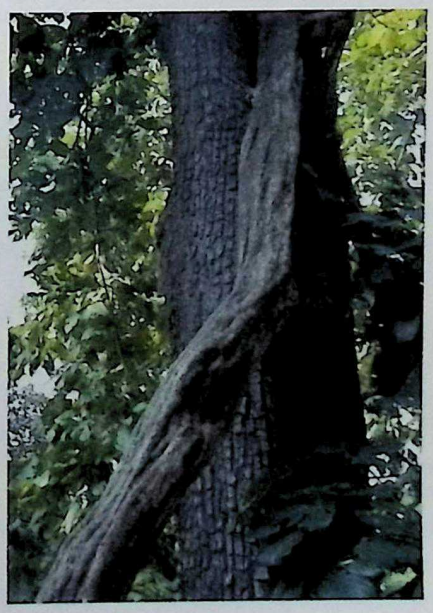
Milletia auriculata Baker ex Brandis, *Otosema extensa* Benth.

Common names

Hindi: ganj, gauj, gonj; ***Malayalam***: vallimuritali; ***Oriya***: arkawla, kissi, rekorlo; ***Telegu***: kondatangedutige.

Description

A suberect evergreen shrub or, more often, a large woody climber up to 20 m in length and 25 cm in stem diameter; bark yellowish-brown with small, rough lenticels; branchlets finely downy. Leaves alternate, imparipinnate, 30–60 cm long; petiole 10–15 cm long, swollen at base; leaflets 7–9, opposite, 7.5–20 cm long, obovate, oblong to elliptic, apex obtuse or cuspidate, silky pubescent beneath. Flowers whitish or brownish, borne in dense axillary racemes 10–23 cm long near the ends of branches, fascicled on a downy rachis; bracts minute, linear; calyx 3 mm long, densely silky, teeth very short; corolla 3 times the length of the calyx, densely silky. Fruits (pods) 12–18 cm long and *c.* 2.5 cm wide, straight, woody, rusty tomentose, with thickened sutures.



Distribution and habitat

Found from the foothills of the Himalayas eastwards to Assam and southwards through central India to northern Andhra Pradesh (only occasionally further south) to an elevation of about 1200 m. Common in moist deciduous forests dominated by sal (*Shorea robusta*) and in moist habitats such as along shaded streambanks in dry deciduous forests.

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Medicinal properties and uses

An infusion of the root is reported to possess insect-repellent properties. The bark is used as a fish poison.

References

Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935).

Mucuna pruriens (L.) DC.

Botanical synonyms

Carpopogon niveum Roxb., *C. pruriens* Roxb., *Dolichos pruriens* L., *Mucuna nivea* (Roxb.) DC., *M. prurita* Hook., *Stizolobium pruriens* (L.) Medikus

Common names

Bengali: alkolshi, alkusa, alkushi, bichchoti; ***English***: common cowitch, cowhage; ***Gujarati***: kandchan, kivanch, kavatch, kivanch, kiwach; ***Hindi***: baikhujani, erka, goncha, kaunch, kiwanch; ***Kannada***: hasaguni, nasugunni, nasukunni; ***Malayalam***: naicorna, naikorana, naikkuruna, shorivalli, shoriyanam; ***Marathi***: kanchkuri, kavacha, kuhili; ***Oriya***: alokushi, baidhonko, kachu, kaincho, morkotomado; ***Punjabi***: gunchgaji, kanaucha, kawanch, konchkari; ***Sanskrit***: atmagupta, kapikacchu, kapikacchuh, kapikachchhu, kapikachhu, kapikachliu; ***Tamil***: amudari, arugrattam, kozhiavarai, punaikkali, punaippidukkan, punaikalei, sugasimbi; ***Telegu***: dulagondi, duradagondi, piliadagu kaila, pilliadugu; ***Urdu***: kavancha.

Description

A large, pubescent, herbaceous or sometimes woody, annual climber. Leaves trifoliate, leaf rachis 5–12 cm long, appressed silky; stipules linear, about 4 mm long; leaflets membranous, 7.5–12.5 cm long and 5–7.5 cm wide, ovate-rhomboid, asymmetrical, apex obtuse or acute, base rounded or truncate, both surfaces grey silky-pubescent. Flowers purple, borne in pendant, axillary, 6–30-flowered racemes 15–30 cm long, the flowers solitary or 2–3 together along a slender silky rachis; pedicels 3–6 mm long, hairy; bracts 1.2 cm long, lanceolate, hairy; bracteoles 8 mm long, hairy; calyx 1 cm long, silky with a few irritant bristles, tube campanulate, upper teeth connate into a triangular lip as long as the tube, lateral teeth lanceolate and as long as the tube; corolla 2.5–3.7 cm long, keel slightly incurved. Fruit (pod) S-shaped, thick, turgid, 5–10 cm long and 1.2–1.8 cm wide, longitudinally ribbed, densely covered with yellow-brown stinging hairs; seeds 4–6, black, ovoid, 1.2 cm long. Flowers and fruits almost throughout the year but mainly between August and January in central Indian deciduous forest regions.

Distribution and habitat

Pantropical in distribution, it is found almost throughout India and in the Andaman and Nicobar Islands in damp habitats, ravines and scrub forests. Occasionally cultivated.

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Medicinal properties and uses

The plant is highly valued in traditional Indian medicine. The seeds and the hairs covering the pods are considered a powerful aphrodisiac in Ayurvedic medicine; they are also used to treat cholera, delirium, impotence, leucorrhoea, spermatorrhoea, urinary troubles and for expelling roundworms. An infusion of the hairs covering the pods is reportedly used to treat liver and gall bladder diseases, and is applied externally as a local stimulant and mild vesicant. *Vanari vatika*, a drug in pill form prepared from the powdered, decorticated seeds after boiling in cow's milk and steeping in honey, is considered to be the best aphrodisiac in Ayurveda; the pills are also used to treat leucorrhoea, menorrhagia and paralysis. The roots are tonic, stimulant, diuretic, purgative and emmenagogue. A decoction of the roots is is reportedly beneficial for treating urinary troubles and delirium associated with fevers; a strong infusion, mixed with honey, is used to treat cholera. A paste prepared from the powdered roots is used externally to treat dropsy, and an ointment prepared from the roots is applied externally to treat elephantiasis. Inhalation of the vapours produced by boiling the powdered roots is considered useful for relieving body-ache associated with coughs and colds among the inhabitants of Bhadrak District in Orissa. The leaves are applied to relieve ulcers; in the form of a paste they are used to promote healing of boils among the tribal inhabitants of eastern Bihar.

Warning

The bristly hairs covering the fresh pods cause intense itching on contact with skin; washing with warm water containing ammonia or alkali brings some relief.

References

Chatterjee and Pakrashi (1992), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Girach *et al.* (1997), Jha and Varma (1996), Kirtikar *et al.* (1935), Sivarajan and Balachandran (1994), Yoganarasimhan (1996).

Pterocarpus indicus Willd.

Common names

English: Andaman redwood, Malay padauk, padauk; ***Kannada***: honne; ***Tamil***: vengai; ***Telegu***: ettavesiga, gandamrigapunetturu, simagandamrigapunetturu, yerravesiga.

Description

A large, buttressed, semi-evergreen tree up to 36 m tall with a broad crown of long drooping branches; bark light brown, finely fissured, inner bark light brown and reddish-brown-streaked, yielding a small amount of red latex when cut. Leaves alternate, imparipinnate, 20–40 cm long; rachis slender, swollen at the base; leaflets 5–11, alternate, thin, shiny green to yellow-green, ovate, 5–10 cm long and 3.8–5 cm wide, apex acuminate with a rounded tip, base rounded or shortly cuneate. Flowers golden

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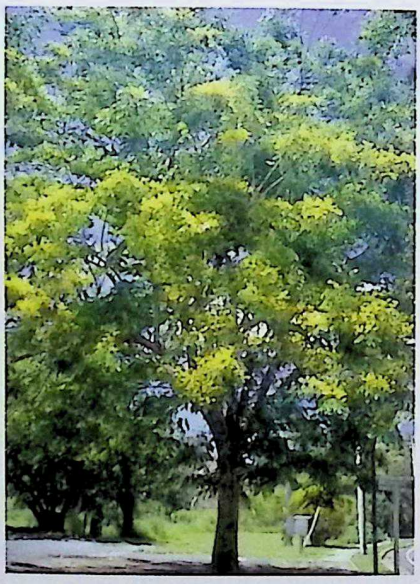

yellow, borne in axillary panicles 10–15 cm long; calyx 6 mm long, turbinate, minutely hairy, 5-toothed, teeth short; corolla 1.5 cm long, exserted, petals 5, 1.5–1.8 cm long, stalked at base, becoming crinkled, the standard orbicular or broadly ovate, 1.5 cm wide, rolled backwards, wings and keel petals 2 each. Fruit (pod) orbicular, 4.5–5 cm across, including the broad, thin, rigid wing stalked at the base with a pointed style at one side, indehiscent; seeds 1–2.

Distribution and habitat

Believed to be native to Malaysia; introduced as a roadside and garden tree in West Bengal, Andhra Pradesh, Tamilnadu and Maharashtra, as well as in many other tropical countries.

Medicinal properties and uses

A decoction of the wood is reportedly used to treat dropsy and bladder stones. The gum (*kino*) obtained from the cut bark is used as an external application to promote healing of sores, and a decoction of the bark is used to arrest diarrhoea. An infusion of the leaves is considered useful for relieving fevers. The seed kernel is emetic.

References

CSIR (1948–1992), Kirtikar *et al.* (1935).

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Pterocarpus marsupium Roxb.

Botanical synonyms

Lingoum marsupium (Roxb.) Kuntze, *Pterocarpus bilobus* Roxb. ex G. Don, *P. marsupium* Roxb. forma *biloba* (G. Don) Prain.

Common names

Bengali: bijasal, piasal, pitashal, pitsal; ***English***: Indian kino tree; ***Gujarati***: bia, bibla, biyo, hiradakhan; ***Hindi***: bija, bijasal, bijasar, murgasal, paisar, pharri; ***Kannada***: bange, honne, volle honne; ***Konkani***: assan, asson; ***Malayalam***: karintakara, malantakara, venga, venna; ***Marathi***: asan, bibla, dhorbenla, dhorbiola; ***Oriya***: byasa, piasal, piyasalo; ***Sanskrit***: asana, asanah, bijaka; ***Tamil***: pirasaram, vengai; ***Telegu***: peddagi, vengisa, yegi; ***Urdu***: damu-lakhvain.

Description

A medium-sized to large, deciduous tree up to 30 m tall, usually with a stout, crooked stem and widely spreading branches; bark thick, yellowish-grey, rough, longitudinally fissured and scaly, the outer layer corky; inner bark pink with whitish markings. The cut bark yields a deep red gum (*kino*) that forms small (3–5 mm), angular, brittle, very dark ruby-red, transparent fragments on drying. Leaves alternate, imparipinnate; leaf rachis to 15 cm long; leaflets usually 5–7, elliptic-ovate to oblong, 6–14 cm long and 4–9.5 cm wide, apex deeply emarginate to acute, base rounded to acute, coriaceous, glabrous on both surfaces, shining above; venation closely parallel; petiolules 6–10 mm long. Flowers fragrant, pale to golden yellow, 1.5 cm long, borne in pubescent, axillary and terminal panicles 12–19 cm long; pedicels short, articulated beneath the flower; calyx 6 mm long, veined, brown-pubescent, teeth very short, triangular, the upper tooth the largest; corolla 1.3 cm long with crisp margins, standard *c.* 1 cm broad with a long claw. Fruit (pod) flat, orbicular, broadly winged, convex, 2.5–5 cm across, pubescent, 1–3-seeded; seeds bony, convex. In central India flowering occurs from August to October and fruiting from October to December; in southern India, the tree flowers from May to October and fruits from July to February.

Distribution and habitat

Found up to 1400 m elevation throughout peninsular India from Gujarat to Bihar southwards, chiefly in deciduous hill forests on a variety of soils, provided they are well-drained. Also occurs naturally in Sri Lanka. Occasionally planted for its timber and gum.

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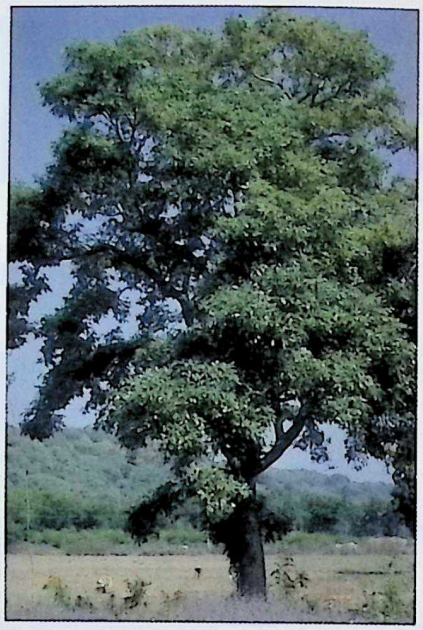
Medicinal properties and uses

The heartwood is a reputed drug in Ayurveda used for the treatment of leprosy and other skin diseases, diarrhoea, dysentery and haemophilic disorders, and is an ingredient of several compound Ayurvedic preparations. A cold aqueous extract of the wood is also considered an esteemed remedy for diabetes. A paste prepared from the stemwood is used as an external application for treating ringworm among the Rabaris of the Barda Hills in Gujarat. Among the Bhils in Rajasthan, the stem bark is boiled and used as a vapour bath following childbirth for its reputed restorative and tonic action. The bark is also used as an astringent and to treat toothache; its decoction is prescribed for the treatment of diabetes among the tribal inhabitants of Sundargarh District in Orissa. The bark and leaves are used in Ayurveda as an external application for itches, scabies, leucoderma, leprosy and other skin diseases. The gum (*kino*) obtained from the cut bark is used as a powerful astringent in the treatment of diarrhoea and dysentery, and applied locally to treat leucorrhoea, passive haemorrhages and toothache. Until 1947 it was official in certain European pharmacopoeias. It is taken orally to treat dysentery and anaemia among the rural inhabitants of northeastern Karnataka. The flowers are reportedly used to relieve fever. The bruised leaves or leaf paste is considered useful as an external application for boils, sores and skin diseases. The tree produces one of the most important timbers in peninsular India; its golden-yellowish heartwood is used for a variety of purposes as a substitute for teak (*Tectona grandis*).



References

Chatterjee and Pakrashi (1992), Chopra *et al.* (1956), CSIR (1948–1992), Jadeja (1999), Joshi (1989), Kirtikar *et al.* (1935), Mukherjee and Namhata (1990), Seetharam *et al.* (1999), Sivarajan and Balachandran (1994), Yoganarasimhan (1996).

Pterocarpus santalinus L. f.

Common names

Bengali: lalchandan, raktachandana; ***English***: red sandalwood; ***Gujarati***: ratanjali; ***Hindi***: lalchandan, ragat chandan, raktachandana, rukhtochandan, undum; ***Kannada***: agaru, honne, kempugandha, patrana, raktashandana; ***Konkani***: raktachandan; ***Malayalam***: patrangam, ratkacandanam, raktashandanam, tilaparnni; ***Marathi***: tambada chandana; ***Oriya***: indrochondono, lohotichondono, raktachandan, roktochondono; ***Punjabi***: chandanlal; ***Sanskrit***: raktacandana, raktacananam, raktacandanah, raktachandana; ***Tamil***: atti, chivappu chandanam, chemmaram, sandana vengai, sensandanam, sivappu chandanam; ***Telegu***: agarugandhamu, rakta gandhamu, yerra chandanamu, yerra sandanum.

Description

A small to medium-sized, deciduous tree up to 11 m tall with a dense, rounded

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crown; bark blackish-brown, deeply cut into rectangular plates, yielding a deep red latex when cut; heartwood extremely hard, dark purple. Leaves usually imparipinnate, 10–18 cm long; leaflets 3, rarely 4–5, 3.8–7.6 cm long, broadly ovate or orbicular, coriaceous, apex obtuse, slightly emarginate, undersurface pale and clothed with fine grey hairs. Flowers yellow, borne a few together in simple or sparingly branched racemes; pedicels *c.* 5 mm long; calyx 5–6 mm long, teeth minute, deltoid. Fruits (pods) obliquely orbicular, 3.8–5 cm in diameter including the wing, base narrowed into a short, concavely curved stipe *c.* 8 mm long, woolly; seeds 1–2, reddish-brown, smooth, leathery, 1–1.5 cm long. Flowers and fruits during the summer months.

Distribution and habitat

Restricted to southern India, principally the southernmost districts of Andhra Pradesh, southeastern Karnataka and northern Tamilnadu at elevations between 150 and 900 m. Typically found on dry, hilly, often rocky sites with very well-drained, usually gravelly, soils. Sometimes planted in gardens or along roadsides.

Medicinal properties and uses

The wood is considered to be astringent, tonic, antipyretic, anthelmintic, antiperiodic, diaphoretic and alexiteric. In Ayurveda it is used to treat vomiting, eye diseases, headache, haemophilic disorders, inflammation and ulcers; it is also considered a blood-purifier and useful for curing skin diseases and poisonous affections. In Unani medicine its paste is used externally to treat fever, inflammation, toothache and hemicrania. A decoction of the pods is reportedly useful as an astringent tonic in the treatment of chronic dysentery.

References

Chatterjee and Pakrashi (1992), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Sivarajan and Balachandran (1994).

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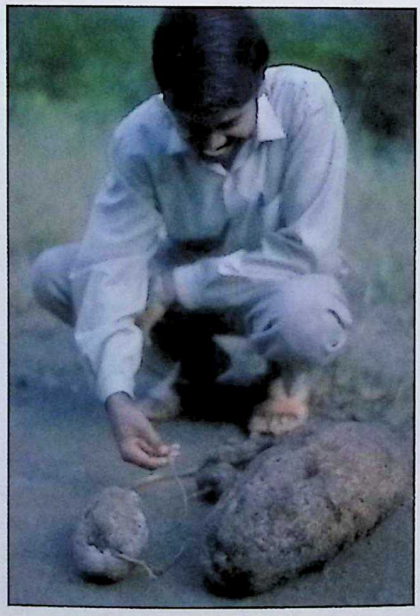
Pueraria tuberosa (Roxb. ex Willd.) DC.



Botanical synonym

Hedysarum tuberosum Roxb.

Common names

Bengali: shimiabatraji; ***English***: Indian kudzu, tuberous honeysuckle; ***Gujarati***: khakarvel, phagvelo, vidarikand; ***Hindi***: bankumra, bharda, bilaikand, patal-kumrha, siali, sural, tirra, vidarkiand; ***Kannada***: gumadi gida; ***Marathi***: badra, bharda, ghorbel, pithana; ***Punjabi***: badar, saloha, salor, siali, sural; ***Sanskrit***: svadukanda, vidari, vidarika; ***Telegu***: dari, darigummadi, gumodi.

Description

A large perennial climber with a woody, tubercled stem up to 12 cm in diameter and very large tuberous roots. Leaves trifoliate; rachis 10–15 cm long; stipules 4 mm long, ovate-oblong, cordate; leaflets subcoriaceous, ovate, 13–20 cm long and nearly as wide, apex acuminate, base cuneate or truncate, glabrescent above, pubescent beneath, lateral leaflets unequal-sided; petiolules 4.5–6 mm long. Flowers bluish-white to purplish blue, borne in lax, leafless racemes 15–30 cm long; pedicels 2–3 mm long, silky-pubescent, fascicled along the rachis; calyx 6–8 mm long, densely silky, teeth shorter than the tube, oblong, obtuse, ciliate; corolla bluish, standard 1.3 cm long and broad, spurred. Fruits (pods) membranous, flat, linear, 5–7.5 cm long, constricted between seeds, densely covered with long, silky, bristly brown hairs; seeds 3–6. In central India flowering occurs from February to April and fruiting from June to August; in Karnataka, the plant flowers and fruits between February and June.

Distribution and habitat

Distributed throughout most of India, except in very wet or very dry regions, up to 1200 m elevation in northern India. It is typically found in dry and moist deciduous and semi-evergreen hill forests and protected valleys in peninsular India, to an elevation of approximately 900 m in the Western Ghats.

Medicinal properties and uses

In Ayurveda, the tuber is considered aphrodisiac, tonic, galactagogue, diuretic, demulcent and alterative; it is reportedly used to

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promote strength and healthy complexion, improve voice, promote breast milk secretion and semen production, and to treat urinary discharges, blood diseases, biliousness, leprosy, general debility, bronchial asthma, intermittent fever, rheumatism and haemorrhage. The peeled and bruised roots are used as a plaster for swollen joints. Crushed and rubbed on the body, they are also used to relieve fever and rheumatism among the Mundas. They are also used as an emetic and tonic.

References

Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935), Sivarajan and Balachandran (1994), Yoganarasimhan (1996).

Sesbania bispinosa (Jacq.) W.F. Wight

Botanical synonyms

Aeschynomene aculeata Schreb., *A. bispinosa* Jacq., *Coronilla aculeata* Willd., *Sesbania aculeata* (Willd.) Poir.

Common names

Bengali: dhanicha, dhunchi, jayanti; ***English***: prickly sesban; ***Gujarati***: ikad, sasi ikad; ***Hindi***: brihatchakramed, dhunchi, jayanti; ***Kannada***: dhaincha, mullujeerangi; ***Malayalam***: kitamu, kitannu; ***Marathi***: bhuiavali, chinchani, kansevari, ranshevari; ***Oriya***: dhaincha, tentua; ***Punjabi***: jaintar, jhanjhan, jhinjan; ***Sanskrit***: itakata, jayanti; ***Tamil***: mudchembai, mullagathi, mulsaembai, nirchembai; ***Telegu***: errajilaju, ettajenga.

Description

An erect, sparsely-branched annual shrub up to 3 m tall; stems semi-woody; branches and leaf rachises more or less prickly. Leaves pinnate; rachis 15–35 cm long; stipules membranous, linear-lanceolate, acuminate, 0.6–1 cm long; leaflets 10–50 pairs, linear-oblong, 0.5–2 cm long and 2–5 mm wide, apex obtuse, mucronate, base acute, glabrous on both surfaces. Flowers 1–1.3 cm long, borne on 3–6-flowered drooping racemes; peduncles slender; pedicels 6 mm long, filiform; calyx 3–4 mm long, membranous, glabrous, teeth deltoid, much shorter than the tube; corolla 10–13 mm long, yellow usually with red dots on the back of the glabrous standard. Fruit (pod) 15–23 cm long and *c.* 2 mm in diameter, straight or slightly curved with slightly indented margins, 35–40-seeded. Flowers from September to November and fruits from October to January.

Distribution and habitat

Native to Australia, but widespread in the Old World tropics. Cultivated during the rainy season throughout most of India to an elevation of 1200 m principally as a green manure crop as well as for its useful fibre. Frequently naturalized in moist habitats such as along the edges of marshes and reservoirs.

Medicinal properties and uses

In Ayurveda the root is considered alexiteric, anthelmintic, diuretic, galactagogue;

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it is reportedly used to treat eye diseases. The seeds are considered stimulant, emmenagogue and astringent; the crushed seeds are used as an external application to treat ringworm and other skin diseases.

References

Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935).

Sesbania grandiflora (L.) Poir.

Botanical synonyms

Aeschynomene grandiflora (L.) L., *Agati grandiflora* (L.) Desv., *Coronilla grandiflora* (L.) Willd., *Robinia grandiflora* L.

Common names

Bengali: agati, agusta, bagphal, bak; ***English***: agathi, sesban, swamp pea; ***Gujarati***: agathio, ayathio; ***Hindi***: agasti, bak, basna, hatiya; ***Kannada***: agache, agase, bakapushpa, kempagase; ***Konkani***: aghasti; ***Malayalam***: agatti, akatthi, athi; ***Marathi***: agasta, agasti, heta, magda, shevari; ***Oriya***: buku, ogosti; ***Sanskrit***: agasthya, agasti, agastya, manitaru, vaka, vangasena; ***Tamil***: agati, kariram, peragathi, sevvagatti; ***Telegu***: agise, avasinana, avesi, sukanasamu, tellayavise; ***Urdu***: agast.

Description

A quick-growing, short-lived, soft-wooded tree to 9 m tall; young stems pubescent. Leaves 12–30 cm long, paripinnate; stipules obliquely ovate, 0.6–1 cm long; leaflets 15–30 pairs, linear-oblong, 2.5–5 cm long and 0.5–1.6 cm wide, glabrous or appressed-pubescent on both surfaces, apex obtuse, emarginate, base rounded. Flowers 5–10 cm long with showy, white, pink or crimson petals, borne on 2–4-flowered racemes. Fruit (pod) pendulous, to 45 cm long and 0.8 cm wide, rather flat and 4-cornered, septate, containing 15–50 pale brown seeds. Flowering may occur throughout the year, depending on locality, but mainly between November and January in central India; fruits mature between March and May.

Distribution and habitat

Probably native to Malaysia and Indonesia; grown in many parts of India (and in other tropical countries) as an ornamental, for fodder, and as a support for pepper and betel vines.

Medicinal properties and uses

The bark, leaves, flowers and tender fruits are used in Ayurvedic medicine. The bark is astringent, bitter, tonic and febrifuge; its decoction is taken in small doses to treat diarrhoea and dysentery; in large doses it is

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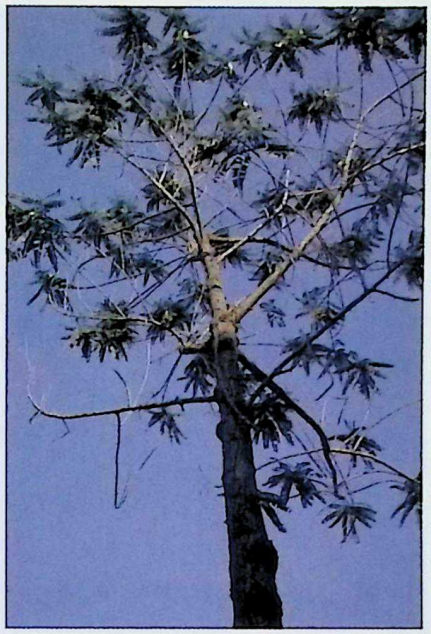
emetic and aperient. An infusion of the bark is recommended during the first stages of smallpox, malaria and other eruptive fevers. The pounded bark is applied externally in the treatment of scabies, and is recommended to treat ulceration of the tongue and alimentary canal. The leaves are aperient, diuretic and laxative; the juice of the leaves and also that of the flowers are used as a popular remedy for nasal catarrh and headache. In Unani medicine the leaves are considered tonic and antipyretic; they are used to treat night blindness and biliousness. A poultice made from the leaf juice is applied to relieve bruises. The leaves are sometimes chewed to disinfect the mouth and throat. The juice from the crushed flowers is used as an eyedrop to improve dimness of vision; the flowers are also considered useful for treating catarrh, cough and consumption. The pods are considered useful for promoting memory power and for resolving tumours or glandular enlargements, treating anaemia and consumption, and dispelling toxins. The seeds, though unpalatable and reportedly toxic, are sometimes used as an emmenagogue. The juice of the roots, mixed with honey, is used as an expectorant. A paste of equal quantities of the roots of the red-flowered variety and stramonium (the dried leaves and flowering tops of *Datura stramonium*: *Solanaceae*) is applied to relieve painful swellings; a paste of the roots in water is applied externally for relief of rheumatic pain. The tender leaves, pods and flowers are eaten as a vegetable.



References

Chatterjee and Pakrashi (1992), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Sivarajan and Balachandran (1994), Yoganarasimhan (1996).

Sesbania sesban (L.) Merr.

Botanical synonyms

Aeschynomene sesban L., *Coronilla sesban* (L.) Willd., *Sesbania aegyptica* (Poir.) Pers.

Common names

Bengali: jainti, jayant, jayanti; ***English***: common sesban, Egyptian rattle pod; ***Gujarati***: jayati, raishingin, raysingani; ***Hindi***: jainti, jait, jayanti, rawasan; ***Kannada***: arisina jinangi, jayanti, jinangi, karijinangi; ***Malayalam***: kedangu, nellithalai, sempa, shempa; ***Marathi***: jarjan, jayat, sevari, shewari; ***Oriya***: baryajantis, joyontri, thaitimul; ***Sanskrit***: jaya, jayanti, jayantika; ***Tamil***: champai, chithagathi, chittakatti, karunchembai, sembai; ***Telegu***: jalugu, samintha, suiminta; ***Urdu***: jait.

Description

A quick-growing, short-lived shrub or small tree up to 6 m tall with soft wood; young shoots striate, green, puberulent. Leaves 7.5–15 cm long including rachis, paripinnate; stipules 3–7 mm long, linear, acute, caducous; leaflets 7–28 pairs, opposite, 0.6–2.5 cm long and 0.3–0.6 cm wide, linear-

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oblong, glabrous, margins entire, apex obtuse and often faintly apiculate, puberulous when young, petiolules minute. Flowers 1.2–1.5 cm long, borne in 3–20-flowered, lax, axillary racemes to 14 cm long; calyx 5 mm long, campanulate, 5-nerved, teeth deltoid, shorter than the tube; corolla yellow, standard orbicular with 2 keel-like appendages, sometimes spotted red or purple on the back, wings falcate-oblong with a minute auricle at the top of the claw, keel straight, obtuse, its petals with a small recurved auricle above the claw. Fruits (pods) 12–23 cm long and 2.5–3.8 mm in diameter, cylindrical, pendulous, twisted, slightly torulose, sharply beaked, septate between the seeds, 20–30-seeded. Flowers mainly between October and December and fruits between November and January in central India.

Distribution and habitat

Widely distributed in tropical Africa and throughout tropical Asia. Cultivated throughout India to an altitude of 1200 m as a shade tree for a variety of crops, as a temporary hedge and windbreak, and as a source of fodder and green manure.

Medicinal properties and uses

In Ayurveda the root is considered carminative, alterative, anthelmintic and useful for treating tuberculous glands, fevers, ulcers, diabetes and leucoderma; it is also considered an excellent cure for scorpion sting. The seeds are stimulant, emmenagogue and astringent, and are used in Unani medicine to heal chronic ulcers and to treat diarrhoea, to reduce enlargement of the spleen, and to reduce excessive menstrual flow. As an ingredient in ointments, or mixed with flour, the seeds are used to cure itches and other skin eruptions. A poultice of the seeds is reported to be a suppurative. Juice of the fresh leaves is credited with anthelmintic properties; a poultice of the leaves promotes suppuration of boils and abscesses and absorption of inflammatory rheumatic swellings. The bark juice is useful for treating various skin eruptions. The flowers are boiled in gingelly oil (from

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seeds of *Sesamum orientale*: *Pedaliaceae*) for use as a bath oil for patients suffering from coryza or nasal catarrh. The leaves and flowers are used in religious offerings.

References

Chatterjee and Pakrashi (1992), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

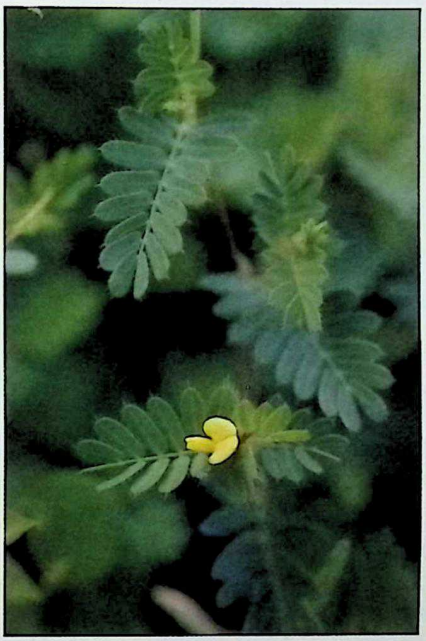
Smithia conferta Sm.

Botanical synonyms

Smithia capicata Desv., *S. germiniflora* Roth, *S. germiniflora* var. *conferta* (Rees.) Baker

Common names

Malayalam: elekanni, thiruthali; ***Marathi***: naichi bhaji; ***Sanskrit***: lakshmana; ***Tamil***: elekanni.



Description

A much-branched, diffuse, prostrate, annual herb with smooth, slender stems 30–90 cm long. Leaves paripinnate; leaf rachis 0.6–2.5 cm long, bristly, ending in a long bristle; petioles short; stipules very large, scarious, lanceolate, acute, prolonged below the insertion into long auricles; leaflets 2–10 (usually 4–6) pairs, linear-oblong, apex mucronate, 0.6–1.2 cm long and 2–4 mm wide, glabrous above, densely bristly along margins and midrib of lower surface. Flowers yellow, solitary or paired in the axils of the upper leaves, which are crowded at the ends of branches forming a congested head; pedicels very short, hairy; bracteoles scarious, 4 mm long, elliptic-oblong, acute, with a long bristle at the apex; calyx 5–6 mm long, lips equal, oblong, acute with a few long bristles at the apex and on the back; corolla 8–11 mm long. Fruits (pods) with 3–7 turgid joints. Flowers and fruits from August to December in southern India.

Distribution and habitat

Native to India and Sri Lanka eastwards to Java and northern Australia. Common throughout peninsular India to an altitude of 1350 m, particularly in moist, open habitats.

Medicinal properties and uses

The herb is considered to possess laxative and tonic properties and is used to treat biliousness and rheumatism, ulcers, and sterility in women.

References

Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

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Tephrosia purpurea (L.) Pers.

Botanical synonyms

Cracca purpurea L., *Galega purpurea* (L.) L., *Tephrosia hamiltonii* Drumm. ex Gamble.

Common names

Bengali: bannilgachh, sarphotika; ***English***: wild indigo; ***Gujarati***: ghodakan, jhila, sarpankho, sarphankho; ***Hindi***: dhamasia, sarphonka; ***Kannada***: empali, koggili, kolingi, phanike; ***Malayalam***: kaata miri, kolinnil, kozhenjil; ***Marathi***: sirapakha, udhadi, unhali; ***Oriya***: kolothiyapokha, mohisiakolothiga, pokha, soropokha; ***Sanskrit***: sharapunkha, sharapunkhah; ***Tamil***: averi, kat kolingi, kolingi, kollukkay-velai, paavali; ***Telegu***: bontavempali, neelavempali, vempali; ***Urdu***: sarabhuka.

Description

A polymorphic, much-branched, suberect, perennial herb usually 30–60 cm tall; branches spreading, glabrous or sparsely pilose. Leaves imparipinnate, 5–15 cm long; petioles 6–12 mm long; stipules linear subulate, nerved, erect or reflexed; leaflets 7–21, narrow, elliptic to oblanceolate, apex obtuse or retuse, mucronate, base acute or cuneate, 2–2.8 cm long and 0.8–1.3 cm wide, glabrous above, silky-pubescent beneath, with numerous closely parallel veins; petiolules of lateral leaflets 1.5–2.5 mm long, those of the terminal leaflets 3–4.5 mm long. Flowers pink, red or purple, 4–9 mm long, borne in many-flowered, leaf-opposed racemes on pedicels 3–4 mm long; calyx 4 mm long, thinly silky, teeth triangular subulate, as long as the tube; corolla twice as long as the calyx, standard pubescent on the back. Fruit (pod) slightly curved, compressed, glabrescent, dehiscing by both sutures, 3–5 cm long and *c.* 4 mm wide, containing 4–10 greenish-grey, smooth, ovoid seeds. Flowers between July and November and fruits from September to January in northern and central India; flowering and fruiting occur year-round in southern India.

Distribution and habitat

Apparently originating in the Old World tropics but now pantropical in distribution, it is a common weed found throughout India to an altitude of 1850 m in the Himalayas. Sometimes cultivated as a green manure crop in paddy fields, and in coconut and banana plantations in South India.

Medicinal properties and uses

The dried herb is considered to possess tonic, laxative, diuretic and deobstruent properties. It is used to treat bronchitis and bilious febrile attacks, and also for treatment of boils, pimples and bleeding piles. It is reported to be useful for relieving coughs and in kidney disorders. The herb has been found to improve liver function; the leaves are reported to be useful in the treatment of jaundice. Among the Baigas of northeastern Madhya Pradesh, an extract prepared from the plant is used as a rub to relieve stiff and aching joints. The leaf paste is applied on the body to relieve body-ache among the tribal inhabitants of southern Bihar. The roots are considered alexipharmic and are

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used in Ayurveda to treat poisoning due to snake bite; in Unani they are used to treat diarrhoea, bronchitis, asthma, liver and spleen disorders, inflammation, boils and pimples. A decoction of the roots is used to treat dyspepsia, diarrhoea, rheumatism, asthma and urinary disorders, and as a vermifuge. A decoction of the roots with ginger is taken to relieve headache among the Irulars in Tamilnadu; among the rural inhabitants of Bhavnagar District in Gujarat, it is used to treat bleeding. The fresh pounded root bark, mixed with black pepper, is given in pill form for relief of refractory colic. A liniment prepared from the roots is used to treat elephantiasis. The Kondhs of southwestern Orissa use the powdered root as a cure for stomach-ache; in northeastern Karnataka the root paste is used as an external application to the stomach to treat indigestion. The powdered roots are smoked for relief from asthma and cough. Among the Gonds of Uttar Pradesh, the powdered root bark is given for the treatment of impotence, the root extract and seed paste are given in the treatment of spermatorrhoea, and a decoction of the root along with that of *Stereospermum chelonoides* (*Bignoniaceae*) is taken after menstruation as an oral contraceptive. A decoction of the pods is used to stop vomiting and as a vermifuge. An infusion of the seeds is used to treat worm infestation in children. The seed oil is recommended for external application against scabies, itch, eczema and other eruptions of the skin.

References

Bhatt and Mitaliya (1999), Bhatt *et al.* (1999), Chatterjee and Pakrashi (1992), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Girach (1992), Girach and Aminuddin (1995), Kirtikar *et al.* (1935), Ragupathy and Mahadevan (1991), Seetharam *et al.* (1999), Singh and Prakash (1994), Sivarajan and Balachandran (1994), Verma *et al.* (1995), Yoganarasimhan (1996).

Trigonella foenum-graecum L.

Common names

Bengali: hoemgreeb, methi, methi-shak, methuka; ***English***: fenugreek; ***Gujarati***: bhaji, methi, methini; ***Hindi***: methi, muthi; ***Kannada***: menk-palle, mente, mentesoppu, menthya, menthya soppu; ***Malayalam***: uluva, venthiam; ***Marathi***: methi; ***Punjabi***: methi, methri, methun; ***Sanskrit***: methi, methika, pitabija; ***Tamil***: vendayam, ventagam; ***Telegu***: mentikura (herb), mentulu (seeds); ***Urdu***: methi.

Description

An aromatic annual herb, 30–60 cm tall. Two fairly distinct types are recognized: the dwarf type, grown for culinary purposes; and the taller varieties that are grown for fodder. Leaves pinnate, trifoliate; stipules not toothed; leaflets 2–2.5 cm long, oblanceolate-oblong, slightly dentate. Flowers white or yellowish-white, borne singly or in pairs in leaf axils; calyx teeth linear; corolla much exserted. Fruits (pods) 3–15 cm long with a long, persistent beak, often falcate, 10–20-seeded, without transverse reticulations; seeds greenish-brown, to 5 mm long and 3.5 mm wide, oblong

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with a deep groove across one corner, giving them a hooked appearance. In northern and central India, flowers in January and fruits in March.

Distribution and habitat

Fenugreek is indigenous from the eastern Mediterranean to central Asia. In ancient Greece and Italy, it was grown as a spring forage crop and for medicinal purposes. Cultivated for centuries as a condiment in North Africa and in many parts of India. Naturalized in the upper Gangetic plains, Punjab and Kashmir.

Medicinal properties and uses

The aromatic seeds are used worldwide as a condiment and for flavouring food preparations. In Ayurveda they are considered tonic, antipyretic, anthelmintic and astringent to the bowels; they are used to treat leprosy, vomiting, bronchitis, piles and heart disease. In Siddha, an infusion of the toasted seeds is used to treat dysentery. They are used externally in poultices to treat boils, abscesses and ulcers, and internally as an emollient for inflammations of the intestinal tract. The leaves are reportedly used both externally and internally for their cooling properties and, in Unani, to relieve swellings and burns and to prevent hair loss. The leaves, both fresh and dried, are eaten as a vegetable, or used as fodder for cattle. The plant also possesses insect-repellent properties.

References

Chatterjee and Pakrashi (1992), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

Uraria picta (Jacq.) Desv. ex DC.

Botanical synonyms

Doodia picta Roxb., *Hedysarum pictum* Jacq.

Common names

Bengali: sankarjata; ***Gujarati***: pilavan, pilo samarveo, pithavan; ***Hindi***: dabra, pithvan, shankaraja, vishnu-jadi; ***Marathi***: pitvan, prasniparni, prisniparni, ranganja; ***Oriya***: ishworojota; ***Punjabi***: deterdane; ***Sanskrit***: chitraparni, guha, prasniparni, prishniparni, prsniparni, sankarjata, shaliparni; ***Tamil***: sittirappaladai.

Description

An erect, sparsely-branched, perennial herb up to 1.8 m tall, finely downy with hooked hairs. Leaves very variable, imparipinnate, 15–25 cm long (including the petiole); petioles 3.8–6.3 cm long, striate, downy; stipules 1.2 cm long, triangular, long-acuminate, striate; leaflets on the upper part of the stem 5–7, rigidly subcoriaceous, 10–20 cm long and 1–2 cm wide, linear-oblong, apex acute, base rounded, blotched with white and glabrous above, finely reticulately veined and minutely pubescent beneath; leaflets on the lower part of the stem 1–3-foliate, suborbicular or oblong. Flowers purple, borne in fascicles along dense cylindrical racemes

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15–30 cm long and 1.6–2 cm broad; rachis and pedicels downy with hooked hairs; pedicels 6–10 mm long, curved upwards after flowering; bracts large, concealing the buds, scarious, striate, ciliate, the upper lanceolate-acuminate, the lower ovate-acuminate, deciduous; calyx 4 mm long, teeth plumose, subulate, much longer than the tube; corolla 6 mm long. Fruit (pod) glabrous, pale grey, joints 3–6, smooth, polished, seedlike, *c.* 3 mm long and 2 mm wide, folded on one another; seeds 1–12, kidney-shaped, reddish. Flowers during the rainy season and fruits during the winter, or between September and December in central India.

Distribution and habitat

Widely distributed in the Old World tropics, from Africa through south Asia to Malaysia and the Philippines. Found in dry grasslands and other open habitats throughout the plains of India, to an altitude of 2000 m in the sub-Himalayan tract from Kashmir to Assam.

Medicinal properties and uses

The root of this herb is one of the components of the Ayurvedic drug *Dasamula* as well as several other compound preparations. It is considered useful for healing bone fractures and for the treatment of urinary diseases, tumours, oedema, burning sensation and difficult breathing. The leaves are considered antiseptic and are used to treat gonorrhoea. The root is credited with aphrodisiac properties; its paste, mixed with water, is used as an antidote for snake bite in Bastar (Madhya Pradesh). Its decoction is prescribed for cough, chills and fevers. The roots and pods are used in the treatment of anal prolapse in infants, and the pods are used to treat sore mouth in children.

References

Chatterjee and Pakrashi (1992), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Hemadri and Rao (1989), Kirtikar *et al.* (1935), Sivarajan and Balachandran (1994), Yoganarasimhan (1996).

Uraria rufescens (DC.) Schindl.

Botanical synonyms

Desmodium rufescens DC., *Doodia hamosa* Roxb., *Uraria hamosa* (Wall.) ex Wight & Arn.

Common names

Bengali: salpan; ***Sanskrit***: salaparni.

Description

A straggling herb or undershrub up to 150 cm tall; young parts clothed with long hairs and shorter hooked bristles. Leaves 1–3-foliate; stipules acuminate from a broad semicordate base, hairy; leaf rachis to 4 cm long; lower leaves simple, round or obovate; upper leaves 3-foliate, leaflets 7.5–12.5 cm long, the terminal leaflet broadly elliptic, apex obtuse or emarginate, rarely acute, base rounded, glabrous above, softly pubescent beneath. Flowers purple, borne in 30–50-flowered, elongated, lax, axillary and terminal panicled racemes up

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to 30 cm long; bracts ovate-cuspidate, hairy, deciduous; pedicels 3–4 mm long, incurved at the apex, often fascicled; calyx 4 mm long, teeth subequal, deltoid-cuspidate, corolla *c.* 6 mm long, standard orbicular or obovate, narrowed into a claw, wings falcate-oblong, adhering to the keel, keel slightly incurved, obtuse. Fruit (pod) with 2–7 glabrous joints, each *c.* 2.5 mm long and wide; seeds quadrate in outline. Flowers between August and October and fruits in November and December in central India.

Distribution and habitat

Native to the Indo-Malaysia region from India and Sri Lanka to Indochina and southern China and parts of Malesia. In India, it is common in grassy ravines of the Himalayas from Kumaun to Sikkim and in Assam to an altitude of 1200 m, southwards through West Bengal, Bihar, Madhya Pradesh and Orissa, to Andhra Pradesh and Karnataka in deciduous forests.

Medicinal properties and uses

In Ayurveda the plant is used as a substitute for *Desmodium gangeticum* (*Fabaceae-Papilionoideae*) in the treatment of oedema, intermittent fevers, diarrhoea, cardiac diseases, emaciation, fever, dyspnoea, polyuria, piles, vomiting and as a rejuvenator. The inhabitants of the Gandhamardan Hills in Orissa use a decoction of the whole plant to relieve bile troubles and acidity.

References

Brahmam and Saxena (1990), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

Zornia gibbosa Spanoghe

Botanical synonyms

Zornia angustifolia Sm., *Z. diphylla* auct. non (L.) Pers., *Z. graminea* Spanoghe

Common names

Gujarati: samrapani; ***Kannada***: nellu jollu soppu; ***Malayalam***: murikoti, nelammari.

Description

An annual, prostrate to suberect herb to 50 cm tall; branches prostrate or ascending. Leaves 2–4-foliate; petioles 0.6–2 cm long; stipules 10 mm long, lanceolate, acute, strongly nerved, produced below the insertion into a triangular spur; leaflets sessile, glabrous, coriaceous, dotted with black gland dots, variable in size and shape, 0.8–2.8 cm long and 0.2–1.6 cm wide, lanceolate to linear-lanceolate, apex acute or apiculate, base rounded, often unequal-sided. Flowers small, in 3–12-flowered spicate racemes 2.5–10 cm long; peduncles slender; bracts foliaceous, to 1.3 cm long, ovate-lanceolate, acute, ciliate, black-dotted, completely enclosing the flower and often the

entire pod; calyx membranous, 3 mm long, the upper two teeth broad, obtuse, connate, ciliate at the apex, the two lateral teeth smaller, deltoid, the lowest tooth the longest, lanceolate, acute, ciliate; corolla twice as

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long as the calyx, standard orbicular, with a long claw. Fruit (pod) 1–5-jointed, either enclosed by the bracts or exserted; joints 2 mm long and wide, indehiscent, covered with short, straight, fulvous spines.

Distribution and habitat

Pantropical; widespread in India in open, grassy habitats or as a weed in cultivated fields to an elevation of 1500 m.

Medicinal properties and uses

The herb is used in the treatment of dysentery and the root is given to children to induce sleep. It is occasionally cultivated as a green manure and cover crop.

References

CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

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Flacourtiaceae

Casearia graveolens Dalz.

Common names

Hindi: aloal, chilla, kathera, nara, naro, pimpri; ***Kannada***: hanise; ***Malayalam***: annavananni, cherukannan; ***Marathi***: bokhada, bokhara, moda, safed karai; ***Oriya***: giridi, kakoli, khonji, kirtti.

Description

A shrub or small deciduous tree up to 6 m tall with dark grey bark, long-spreading and somewhat pendulous branches, and obtusely angular branchlets. Leaves alternate, broadly elliptic, margins more or less crenate-serrate, apex obtuse or acuminate, 8–20 cm long and 4–10 cm wide; main nerves 8–12 pairs, prominent beneath; petioles 0.6–1.3 cm long; stipules 0.8 cm long, lanceolate-subulate, deciduous. Flowers small, green, with a disagreeable odour, numerous, clustered in leaf axils; pedicels articulated above the base, very short when in flower, elongating in fruit; calyx pubescent outside, 3–4 mm long, deeply 5-lobed, lobes oblong, obtuse, concave, green. Fruits conspicuously yellow, 3-valved ellipsoid or ovoid capsules, 2–2.5 cm long, glabrous, ribbed, orange or yellow when ripe, containing 10–12 ovoid, compressed seeds with a scarlet aril. Flowers between May and June; fruits between July and August in central Indian deciduous forests. The leaves turn a copper colour in December and remain leafless from January–February to June in central India.

Distribution and habitat

Found throughout most of India from Himachel Pradesh eastwards to Assam and in northern peninsular India to Maharashtra, Karnataka and Andhra Pradesh, generally at lower elevations in moist hilly locations; common on abandoned agricultural sites.

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Medicinal properties and uses

The tribal inhabitants of northern Gujarat use a paste prepared from the roots as an external application to treat piles; its juice is taken internally to treat jaundice. A decoction of the bark and roots is reportedly used to alleviate stomach pain.

Warning

The leaves and fruits are poisonous.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935).

Casearia tomentosa Roxb.

Botanical synonyms

Anavinga lanceolata Lam., *Casearia elliptica* Willd.

Common names

Bengali: maun; ***Gujarati***: dholo-con, gholoum, munzal, sunjhal; ***Hindi***: bairi, beri, bheri, chilara, chilla, kirci; ***Kannada***: biliyubina, hanise, hlingi, konje; ***Malayalam***: anakkarana, anavananni, vapunnakannan; ***Marathi***: bokhade, chillara, karei, lainja, massei, modi, mogdi; ***Oriya***: girari, giridi, kakoli, khonji, kirtti, kokra; ***Sanskrit***: kampillaka; ***Tamil***: kadichai, kaludukkutti, kottal, kutti; ***Telegu***: charcho, chilakaduddi, gamudu, girugudu, kalamisvari, pisiki, vasanga.

Description

A shrub or small tree up to 9 m tall; bark ash-coloured, exfoliating in square or rounded flakes; branchlets tomentose or pubescent. Leaves variable in size, 6–18 cm long and 4–7 cm wide, elliptic-oblong or lanceolate, apex acute, base rounded or subcordate, margins serrate (sometimes entire), slightly pubescent or glaucous above, pubescent or tomentose beneath; main nerves 8–10 pairs; petioles 0.4–0.9 mm long, densely pubescent; stipules minute, pubescent, deciduous. Flowers small, greenish-yellow or -white, borne in dense or sometimes few-flowered axillary clusters; pedicels jointed at base, approximately 4 mm long; calyx pubescent, tube *c.* 0.8 mm long, lobes 3 mm long, broadly elliptic, obtuse. Fruit a fleshy, shining, glabrous, ribbed, 3-valved ellipsoid capsule up to 2.5 cm long and 2 cm in diameter, yellow when ripe, containing many angular or obovoid seeds embedded

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in a soft, pulpy, scarlet mass consisting of the agglomerate arils. Flowers and fruits between February and June.

Distribution and habitat

Widespread throughout India in moist, hilly locations up to 900 m elevation from the foothills of the Himalayas southwards, and in the Andaman Islands. In southern India it is very common on open grazing lands at lower elevations and rare in the Western Ghats.

Medicinal properties and uses

The pounded stem bark is applied externally to treat dropsy and fever. The powdered bark, soaked in water, is applied externally to treat oedema and snake bite by the tribal inhabitants of Sundargarh District in Orissa. The root bark is reputed to be a tonic for anaemic conditions and to stimulate liver function. A decoction of the root is reported to be a remedy for diabetes. The leaves are employed in medicinal baths, and the leaf-paste is used as an anthelmintic. The edible fruit pulp is considered a useful diuretic and has hypoglycaemic properties. Oil extracted from the seeds is used externally for sprains.

References

Asolkar *et al.* (1992), Chatterjee and Pakrashi (1992), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Mukherjee and Namhata (1990).

Flacourtia indica (Burm. f.) Merr.

Botanical synonyms

Flacourtia latifolia Cooke, *F. occidentalis* Blatter, *F. ramontchi* L'Herit., *F. ramontchi* var. *sapida* (Roxb.) Hook f. & Thoms., *F. ramontchi* var. *latifolia* Hook. f. & Thoms., *F. ramontchi* var. *occidentalis* Hook f. & Thoms., *F. sapida* Roxb., *F. sepiaria* Roxb.

Common names

Bengali: baichi, benchi, binja, katai, tambat; ***English***: governor's plum, Madagascar plum; ***Gujarati***: galgugal, kankod, katamla, rankdi, yenkdi; ***Hindi***: bhanber, bilangra, kandai, kanju; ***Kannada***: gabajira, gajale, hanmunki, hanumanth, hattarimulu, mulluthare, mulluthotti; ***Malayalam***: aghori; ***Marathi***: bhekal, binka, kaker, kuki, paker, tambat; ***Oriya***: balibhaincho, boincha, boniso, kontadhawara, kontakuli, mamuri, potnaboniso; ***Punjabi***: kakoa, kandei, kangu, kukai; ***Sanskrit***: swadukantaka,

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svadukantaka; ***Tamil***: sottaikala, chothakilai, kattukala, katukali, sottaikala; ***Telegu***: gandregu, giamehetu, kanregu, mulutiruman, putikithada.

Description

A deciduous shrub or small tree up to 10 m tall; bark rough whitish-grey or pinkish-brown, exfoliating in irregular thin scales; branches usually armed with axillary thorns; spines on trunk up to 12 cm long, sometimes branched. Leaves red-pink when young, alternate, variable in size or shape, 3–12 cm long and 2.5–5 cm wide, usually ovate or elliptic, apex obtusely acuminate, obtuse or rounded, base cuneate to rounded, margins coarsely crenate or serrate, glabrous or pubescent above, more or less pubescent beneath; lateral veins 4–7 pairs; petioles 0.3–2 cm long. Flowers greenish-yellow, generally unisexual, in short tomentose racemes; sepals 4–5, *c.* 2 mm long, ovate or orbicular, hispid and ciliate; petals absent. Fruit a globose dark-red or black, fleshy berry, 0.8–2.5 cm across, with persistent style; seeds 8–16, 0.8–1 cm long and 0.4–0.7 cm wide, with a pale brown, rugose testa. Flowers between December and March; fruits ripen from March to July in most parts of central India.

Distribution and habitat

Native to tropical and subtropical Africa and Asia, and common in deciduous and evergreen forests throughout the drier parts of India up to 1000 m elevation. In peninsular India it is common in mixed deciduous and scrub forests.

Medicinal properties and uses

The edible fruits are considered appetizing and digestive; they are used to treat jaundice and enlarged spleen. The Irulars of Tamilnadu use the juice of the leaves, taken with curd (yoghurt), to treat dysentery. The leaves are reportedly taken orally to treat dysentery in Rajasthan. The bark is considered astringent and diuretic; its paste is taken with small red chillis to relieve chest pains by inhabitants of the Gandhamardan Hills in Orissa, and used externally to treat eczema among the tribal inhabitants of Udaipur District in Rajasthan. The bark, pounded in water, is taken as a post-delivery tonic by Sahariya women in northwestern Madhya Pradesh. The Bhils of Madhya Pradesh use the paste of the roots as a local application to treat skin diseases. Ayurvedic physicians in Kerala consider the root to be cooling, depurative, diuretic and useful for treating biliousness, rheumatism, skin diseases, urinary disorders and mental disorders.

References

Asolkar *et al.* (1992), Brahmam and Saxena (1990), Chatterjee and Pakrashi (1992), Chopra *et al.* (1956), CSIR (1948–1992), Jain *et al.* (1989), Katewa and Arora (1997), Kirtikar *et al.* (1935), Sikarwar and Kaushik (1992), Sivarajan and Balachandran (1994).

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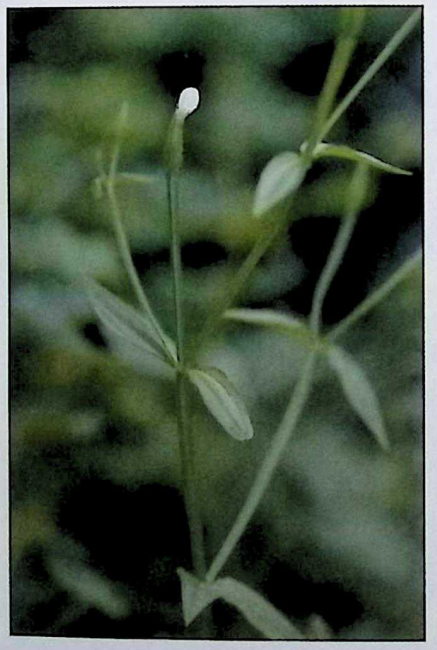
Gentianaceae

Canscora decusata (Roxb.) Roem. & Schult.



Botanical synonyms

Exacum alatum Roth., *Pladera decussata* Roxb.

Common names

Bengali: dankuni, shvetabona; ***Hindi***: kalameg, sankhabati, sankhahuli, shanhini; ***Kannada***: shankha pushpa; ***Konkani***: shankha-pushpi; ***Marathi***: sankhvel, shankha-pushpi, titavi, yavotchi; ***Sanskrit***: sankhapuspi, sankhapushpi, shanka-pushpi.

Description

A slender, erect, somewhat flaccid annual herb up to 60 cm tall, with quadrangular, 4-winged stems and decussate branches. Leaves narrowly ovate to oblong-lanceolate, 0.5–4 cm long and 0.4–1.6 cm wide, apex acute, base subcordate to rounded, basally 3-nerved. Flowers white, borne in lax cymes; calyx 8–13 mm long, 4-winged; corolla tube as long as the calyx, lobes 6 mm long, obovate. Fruits (capsules) linear-oblong, 6–8 mm long and 2 mm broad, obtuse at apex, tipped by a persistent style, containing brown seeds. Flowers and fruits mainly from November to March.

Distribution and habitat

Found in tropical Africa, the Indian subcontinent and Southeast Asia. Common throughout India on moist, grassy sites, in fields and in sal (*Shorea robusta*)-dominated forests, up to about 1600 m elevation in the Himalayas and to 900 m in southern India.

Medicinal properties and uses

In Ayurveda the herb is considered one of the sources of *Sankhapuspi* (the other sources being *Clitoria terneata*: *Fabaceae-Papilionoideae* and *Convolvulus pluri-*

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caulis: *Convolvulaceae*), a notable drug used to improve memory power and intellect. It is regarded as alterative, laxative, alexiteric, anthelmintic and is highly regarded as a nervine tonic, a paste made of the whole plant (including the flowers) being taken with milk for this purpose. It is also used as a substitute for *Yavatikta*, whose accepted source is *Andrographis paniculata* (*Acanthaceae*), the whole plant being used to treat liver disorders, intermittent fever and leprosy; it is also used to improve taste and appetite, and to treat leucoderma, tuberculosis, inflammations and abdominal troubles. The fresh juice of the plant is prescribed to relieve nervous debility, to improve memory and voice, and to treat epilepsy, insanity, leprosy, scrofula, oedema, urinary disorders and snake bite.

References

Asolkar *et al.* (1992), Chatterjee and Pakrashi (1995), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Sivarajan and Balachandran (1994), Yoganarasimhan (1996).

Enicostema axillare (Lam.) Raynal

Botanical synonyms

Adenema hyssopifolia G. Don., *Cicendia hyssopifolia* Wight & Arn., *Enicostema verticillare* Baill., *E. littorale* auct. non Blume, *Exacum hyssopifolium* Willd., *Gentiana axillare* Lam., *G. verticillata* L., *Slevogtia orientalis* Griseb.

Common names

Bengali: nagajivha; ***Gujarati***: madvinabi, mamijava, mamejavo; ***Hindi***: chhotakirayata, chotachirayata; ***Kannada***: chikka chirayutha; ***Malayalam***: vallari, vellaragu; ***Marathi***: kadavinayi, mamivju, tanavadi; ***Sanskrit***: mamajjaka, nagajivha, nahi; ***Tamil***: vallari, vellaragu, vellarai; ***Telegu***: nelaguli, nelagulimidi.

Description

A glabrous perennial herb 10–50 cm high with ribbed, quadrangular stems; younger parts glaucous green; rootstock stout. Leaves opposite, decussate, sessile, linear to elliptic-oblong or lanceolate, 3.2–6.3 cm long and 0.3–1.6 cm wide, apex obtuse or acute, tapering at base, 3-nerved. Flowers white or bluish, sessile in whorled axillary clusters; calyx 3 mm long, lobes 1.5 mm long, ovate-oblong, obtuse, with narrow membranous margins; corolla 6–8 mm long, tubular, lobes 2.5 mm long, lanceolate, acute. Fruit (capsule) ovoid to subglobose, 3–4 mm long and 3 mm in diameter, faintly grooved on 2 opposite sides; seeds subglobose to rhomboid, 0.5 mm long, reticulate.

Distribution and habitat

Found throughout most of India to an altitude of about 450 m, from Punjab and the Gangetic Plain southwards, most com-

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monly in coastal areas. Also occurs in Sri Lanka, tropical Africa and the West Indies.

Medicinal properties and uses

The plant is pungent and very bitter; it is used in Ayurveda as an anthelmintic. It is also considered to have tonic, stomachic and laxative properties, and is reportedly used for treating diabetes. Among the tribal and other rural inhabitants of Bhavnagar District in Gujarat, a decoction of the whole plant is given to treat fever, jaundice and diabetes. The crushed plant mixed with water is used as a restorative. The whole plant, dried, powdered and mixed with honey, is used as a blood-purifier and to relieve dropsy, rheumatism, abdominal ulcers, hernia, swellings, itches and insect poisoning. The plant is used as a substitute for *chiretta* (*Swertia chirayita*: *Gentianaceae*) as an effective treatment for malaria. The Irulars of Tamilnadu use the secondary roots as a toothbrush to cure toothache.

References

Asolkar *et al.* (1992), Bhatt and Mitaliya (1999), Chopra *et al.* (1956), CSIR (1948–1992), Jadeja (1999), Kirtikar *et al.* (1935), Ragupathy and Mahadevan (1991), Yoganarasimhan (1996).

Hoppea dichotoma Heyne ex Willd.

Common names

None reported.

Description

A small, erect, divaricately branched herb, 5–15 cm tall; stem and branches quadrangular, more or less winged. Leaves opposite, sessile, ovate, about 6 mm long and 3 mm wide, apex acute. Flowers small, greenish-white or pale yellow, in 2–3-flowered cymes; pedicels short; bracts lanceolate; calyx campanulate, 2.5–3 mm long, membranous, lobes 1.5 mm long, overtopping the corolla, lanceolate, very acute with a green nerve at each margin; corolla tubular, 2 mm long, pale yellow, lobes half as long as the tube, ovate-oblong, obtuse. Fruit (capsule) globose or ellipsoid, about 2 mm long; seeds minute. Flowers and fruits from October to December.

Distribution and habitat

Found throughout most of India to an altitude of about 900 m in moist, open habitats and on streambanks.

Medicinal properties and uses

The plant is used to treat piles and snake bite. The Mundas use the roots to treat epilepsy.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

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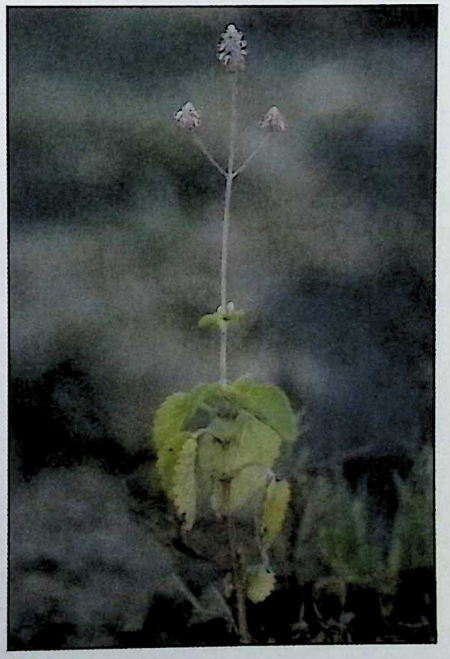
Lamiaceae

Anisochilus carnosus (L. f.) Wall. ex Benth.

Botanical synonyms

Lavandula carnosa L. f., *Plectranthus dubius* Spreng.



Common names

English: thick-leaved lavender; ***Gujarati***: ajama, ajmanupatru, ubhoratavelio; ***Hindi***: panjirikapat, sitaki; ***Kannada***: doddapatri, karaveru, karpurada gida; ***Konkani***: savir-sambharu; ***Malayalam***: chomara, patukurkka; ***Marathi***: choraonva, kapurli; ***Sanskrit***: ajapada, induparni, ulpalabheda; ***Tamil***: karpuravalli; ***Telegu***: karpuravalli, omamuaku, rogachettu.

Description

An erect, annual herb up to 60 cm tall, with stout, quadrangular stems, often tinged with red. Leaves 2.5–6.3 cm long and 1.3–4 cm wide, ovate-oblong or rounded, apex obtuse, base subcordate or rounded, margins crenate, usually pubescent beneath, prominently nerved and dotted with globose orange-red oil globules on both surfaces; petioles 0.6–6.6 cm long. Flowers pale purple, borne in dense, long-peduncled spikes 1.3–3.8 cm long; bracts 3 mm long, broadly ovate, acuminate, pubescent and glandular, ciliate, veined; calyx pubescent, 5 mm long in flower, to 8 mm long in fruit; corolla 1 cm long, pubescent outside, tube narrow below, inflated above, upper lip short, erect, with very shallow rounded lobes, lower lip 4 mm long, concave. Fruits (nutlets) brown, suborbicular, 1.2 mm in diameter, compressed, smooth, polished, brown.

Distribution and habitat

Native to southern Asia from Pakistan to Sri Lanka and Myanmar (Burma); found

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throughout most of India in dry, rocky habitats, to an altitude of 2400 m in the western Himalayas.

Medicinal properties and uses

The plant is considered stimulant, expectorant and diaphoretic. It is used in Bihar to dress wounds. The juice of the fresh leaves is credited with cooling properties and is used to relieve urticaria associated with liver disorders and other allergic reactions; mixed with sugar-candy, it is used as a home remedy for coughs and colds. Mixed with sugar and gingelly oil (from seeds of *Sesamum orientale*: *Pedaliaceae*), it is used as a cooling liniment for the head. In Siddha, the leaf is used for treating cough, digestive disorders and dropsy. The leaves can be eaten as a vegetable.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

Anisomeles indica (L.) O. Kuntze

Botanical synonyms

Anisomeles ovata R. Br., *Ballota distichia* L., *Nepeta indica* L.

Common names

Gujarati: chodharo, gopali; ***Kannada***: hennu karee thumbe, mangamari soppu; ***Malayalam***: chedayan; ***Oriya***: bhutamari; ***Tamil***: chedayan, eramuttai.

Description

An erect, camphor-scented, variable herb or woody shrub up to 2 m tall, with quadrangular, softly pubescent stems. Leaves rather thick, broadly ovate, 4–10 cm long and 2–6 cm wide, base rounded or subcordate, apex acute, margins crenate-serrate, hairy to softly pubescent on both sides; petioles 1–7.5 cm long. Flowers borne in dense whorls in leaf axils below and in dense, spiked inflorescences 8–32 cm long above; bracts 3–5 mm long, linear, clothed with long, stiff hairs; calyx 6 mm long, hirsute, teeth lanceolate, acute, nearly as long as the tube, hairy on both sides, ciliate; corolla 1.6 cm long, light purple or dark red with a deep blue lower lip, tube 4 mm long, upper lip 6 mm long, oblong, rounded at apex, lower lip much longer, 3-lobed. Fruits (nutlets) 2.5 mm long, broadly ovoid with rounded ends, smooth, polished, turning black when ripe.

Distribution and habitat

Found throughout tropical and subtropical India except in very dry regions, to an altitude of 1800 m as a weed on degraded sites, on roadsides and in forest clearings and scrub jungles. Also occurs naturally in Sri Lanka, Malaysia, southern China and the Philippines.

Medicinal properties and uses

The herb possesses aromatic, astringent, carminative and tonic properties. It is used

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to treat gastric catarrh and intermittent fevers. A decoction of the herb is applied to relieve itches and to treat convulsions. An essential oil present in the herb is reportedly useful for treating uterine affections. The whole plant boiled in water is reportedly used as a general vapour bath by the Kathodias of Rajasthan to lower body temperature in the treatment of typhoid. When burnt, the plant acts as a mosquito repellent.

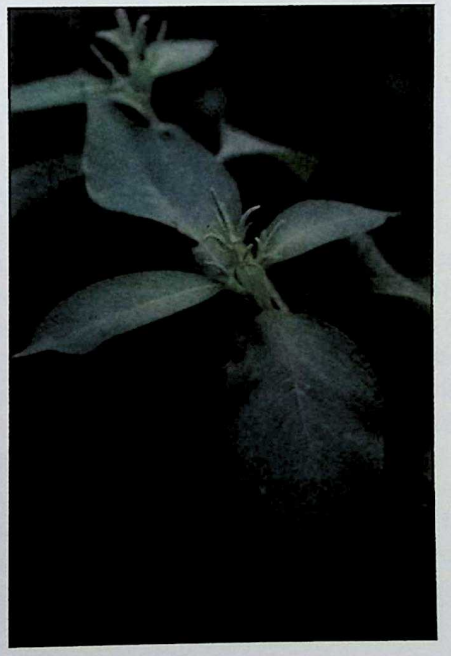
References

Asolkar *et al.* (1992), Chopra *et al.* (1956), CSIR (1948–1992), Joshi (1989), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

Colebrookia oppositifolia Sm.

Common names

Hindi: binda, bindu, pansra; ***Kannada***: tuggigida; ***Marathi***: dasari; ***Oriya***: bosiki, darigopi; ***Punjabi***: barmera, briali, duss, sampru, shakardana, suali.



Description

A much-branched shrub up to 3 m tall with a light-coloured, stout stem and pale, subquadrangular, grooved branches, usually verticillate in threes; young shoots clothed with grey tomentum. Leaves crowded towards the ends of branches, opposite or verticillate in groups of 3, 10–15 cm long and 2.2–4.5 cm wide, oblong-lanceolate, apex acute, base acute, margins crenulate or serrulate, softly pubescent on both sides; petioles 1–2.5 cm long. Flowers white, minute, borne in paniculate, often ternately arranged spikes 5–10 cm long and 0.6 cm in diameter; calyx in flower 2.5–3 mm long, 5-partite, teeth plumose with white hairs, elongating to nearly 6 mm in fruit; corolla 2 mm long, upper lobe emarginate. Fruits (nutlets) 0.9 mm long, oblong-obovoid, pubescent. In central India flowering occurs between December and February and fruiting in February and March.

Distribution and habitat

Found more or less throughout India in forested hill regions at low elevations, typically in valleys, ravines and on shaded hillsides, to an elevation of 1100 m in southern India.

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Medicinal properties and uses

A preparation made from the root is used by the Santhalis and Mundas (in Bihar) to treat epilepsy. An infusion of the root is given to treat asthma among the tribal inhabitants of eastern Bihar. The leaves are applied to promote healing of wounds and bruises. In Bastar (Madhya Pradesh) the leaves are chewed and their juice swallowed to relieve cough.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956), Hemadri and Rao (1989), Jha and Varma (1996), Kirtikar *et al.* (1935), Varma (1997).

Hyptis suaveolens (L.) Poit.

Botanical synonyms

Ballota suaveolens L., *Bysteropogon graveolens* Blume

Common names

Bengali: bilati tulsi; ***Hindi***: wilayati tulsi; ***Oriya***: gangatulsi, dimbubuha, purodo; ***Sanskrit***: bhustrna.

Description

A rigid, erect, much-branched, sweetly aromatic herb, sometimes up to 2 m tall, with obtusely quadrangular stems. Leaves very variable, broadly ovate to suborbicular, margins crenate-serrulate, tomentose and dotted with oil globules beneath; lower leaves *c.* 12 cm long and 9 cm wide, base subcordate, upper leaves smaller, base acute; petioles 1.5–4.4 cm long. Flowers small, blue, borne 2–4 together in axillary or terminal heads or in racemes; calyx compressed, tube 6 mm long in fruit. Fruits (nutlets) blackish-brown, ovoid-oblong, compressed, 0.3 cm long, pubescent with mucilaginous hairs.

Distribution and habitat

Native to tropical America and introduced to many tropical countries, often naturalized as a weed in open waste places along roadsides and field borders. Found in northeastern and peninsular India and in the Andaman and Nicobar Islands. Sometimes grown in gardens.

Medicinal properties and uses

The herb is considered to be stimulant, carminative, sudorific and lactagogue. Its infusion is used to treat fever, catarrhal ailments, and uterine affections; the infusion or the pounded leaves are used externally to treat parasitic skin diseases. In Ayurveda the whole plant is used to treat worm infestation and as an emetic. The Mundas use the herb to relieve headaches and as a snuff to stop nosebleeds. The leaf juice is used to treat colic and stomach-ache. Among the Paharia and Santhalis in eastern Bihar, the root extract is given to relieve haematuria. A decoction of the roots is used as an appetizer.

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Chewed with betel-nuts, the root is used as a stomachic. In the Philippines the leaves and tops are considered to be antispasmodic and are used in antirheumatic and antisoporific baths.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935), Kumar and Goel (1998), Yoganarasimhan (1996).

Lavandula angustifolia Miller

Botanical synonyms

Lavandula officinalis Chaix, *L. spica* L., *L. vera* DC.

Common names

English: common lavender, true lavender.

Description

A hardy, much-branched low shrub up to 1.2 m tall with quadrangular stems. Leaves opposite, oblong-linear or lanceolate, tomentose, margins entire. Flowers small, pale purple, highly fragrant, borne in terminal spikes; bracts persistent; calyx erect, ovoid-tubular, shortly 5-toothed, 13–15-nerved; corolla oblique, 2-lipped.

Distribution and habitat

Native to montane areas of southern Europe and North Africa from Spain and Morocco to Italy and Tunisia. Extensively cultivated in this region, particularly in France, and occasionally in other countries for the fragrant oil extracted from its flowers, which is highly valued for perfume. In India it is cultivated on a small scale in Kashmir and in some parts of the Nilgiris in northwestern Tamilnadu.

Medicinal properties and uses

Lavender oil possesses carminative and stimulant properties, and is recommended as an insect repellent. It is sometimes used to cover disagreeable odours in ointments and other medicinal preparations.

References

Chopra *et al.* (1969), CSIR (1948–1992).

Lavandula bipinnata Kuntze

Botanical synonym

Lavandula burmanii Benth.

Common names

Gujarati: asmanifalgoto, sarpnocharo, surpanocharo; ***Sanskrit***: sankhapuspi.

Description

A slender, erect, aromatic herb up to 1 m tall, with simple or branched, finely pubescent, quadrangular stems. Leaves opposite, sessile or nearly so, 3.7–10 cm long and wide, pinnatipartite or deeply pinnatisect, with linear lobes that may be entire or den-

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tate. Flowers small, blue or white, fragrant, borne in simple or compound (panicled) spikes; bracts finely pubescent, persistent, 6–8 mm long, with a long, capillary awn at the apex; fruiting calyx 5 mm long, tubular, clothed with fine hairy pubescence, 5-toothed, teeth lanceolate, acute; corolla blue or white, pubescent outside, *c.* 1.3 cm long, tube 8 mm long, upper lip 3 mm long, oblong with 2 rounded lobes, lower lip 5-partite, the middle lobe rounded and more than twice as long as the ovate lateral lobes. Fruits composed of 4 minute black nutlets, oblong-ellipsoid, *c.* 2 mm long, black, smooth, mucilaginous when wet. Flowers in October and November in central India.

Distribution and habitat

Native to peninsular India from southern Rajasthan and Chota Nagpur (southern Bihar) to Tamilnadu.

Medicinal properties and uses

A solution or paste of the roots is reportedly used as an external application to treat stings and bites of poisonous animals.

References

Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935).

Leonitis nepetaefolia (L.) R. Br.

Botanical synonym

Phlomis nepataefolia Roxb.

Common names

Bengali: hejurchei; ***Gujarati***: matijer, matisul; ***Hindi***: hejurchei; ***Kannada***: kaadu thumbe gida; ***Marathi***: dipmal; ***Sanskrit***: granthi, granthika, granthiparna, granthiparni; ***Telegu***: beri, hanumantabira, mulugolimidi, ranabheri.

Description

An ornamental herb or shrub, 1.2–2.6 m tall; stem and branches obtusely 4-angled, deeply grooved on opposite sides, finely tomentose. Upper leaves ovate-lanceolate, 5.6–8.5 cm long and 1.5–2.6 cm wide, acute at base; lower leaves ovate to broadly ovate, 4–20 cm long and 3–15 cm wide, broadly rounded or truncate at base; all leaves acute to subacute at apex with crenate-serrate margins; petiole 1.5–12 cm long, upper part winged. Flowers orange-scarlet, bristly, borne in dense, globose, axillary whorls 3.8–6.3 cm in diameter; floral leaves lanceolate, deflexed; bracts linear, up to 16 mm long, strongly spinous-pointed, deflexed, pubescent; calyx 2 cm long, ribbed, tubular, generally pubescent, 8–9-toothed; corolla 2.5 cm long, tube 1.3 cm long, upper part with orange-scarlet hairs, with 3 transverse parallel rings of white hairs within; upper lip 1.3 cm long, densely woolly, lower lip 4–5 mm long, trilobed. Fruits (nutlets) oblong-ovoid, about 0.4 cm in diameter, obliquely truncate with ribbed margins.

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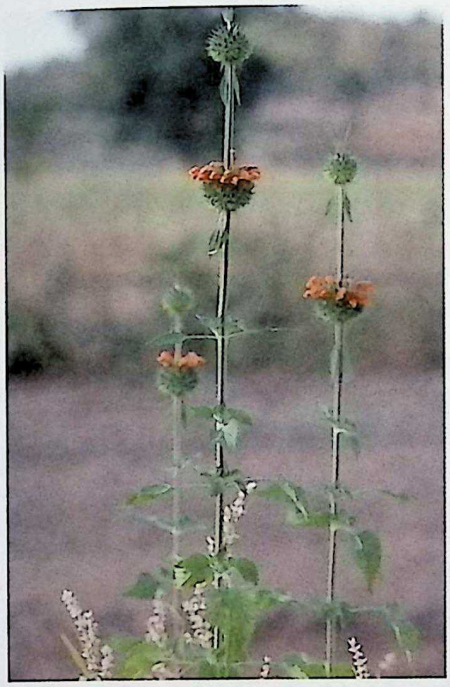

Distribution and habitat

Cultivated and often naturalized throughout the tropics, including most of tropical and subtropical India. Typically found near villages on roadsides and waste places.

Medicinal properties and uses

Ashes of the flower heads are applied to relieve scalds and burns in the Chota Nagpur region; mixed with curd (yoghurt), they are applied to treat ringworm and other skin diseases. The Mundas of Chota Nagpur use the pounded flower heads, fried in oil, as an external application to relieve itches and head sores in children. The ashes of the plant, mixed with mustard oil, are used by the Birhors and Santhalis of Bihar as a local application to relieve paralysis. Nursing Munda women rub the crushed roots on swollen breasts to stimulate the flow of milk. In Ayurvedic practice, the leaves are used to treat nasal disorders, stomatitis, indigestion and worm infestation. The seeds reportedly possess antimalarial activity. In Brazil, the crushed leaves are used externally to relieve rheumatism.

References

Chopra *et al.* (1956, 1969), CSIR (1948–1992), Jain *et al.* (1989), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

Leucas cephalotes (Roxb. ex Roth) Spreng.

Botanical synonym

Phlomis cephalotes Roth

Common names

Bengali: barahalkusa, ghalaghase; ***Gujarati***: doshinokubo, dosino kubo, khetraukubu, kubi, kubo; ***Hindi***: deldona, dhurpisag, goma, motapati; ***Marathi***: deokhumba, shetvad, tumba; ***Punjabi***: chatra, guldoda, maldoda; ***Sanskrit***: dronapushpi, dronapuspi; ***Telegu***: peddatumni, tumni.

Description

An erect, hairy or pubescent annual herb up to 1 m high with quadrangular stems and

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branches. Leaves narrowly ovate or ovate-lanceolate, 3.8–7.5 cm long and 1.3–2.5 cm wide, apex subacute, margins crenate-serrate; petioles 0.6–1.3 cm long. Flowers small, white, sessile, borne in dense, globose, terminal whorls 2.5–5 cm in diameter; bracts foliaceous, green, thin, 13–16 mm long and 2.5–5 mm wide, lanceolate, acute, awned, ciliate; calyx tubular, membranous, smooth outside, teeth narrowly triangular-subulate, *c.* 1.2 mm long; corolla 2 cm long, tube less than 1.3 cm long, upper lip 4 mm long, white-woolly, lower lip nearly twice as long as the upper, with a large truncate middle lobe and very small lateral lobes. Fruits (nutlets) 3 mm long, obovoid-oblong, rounded at the apex, smooth, brown. Flowers and fruits from September to December.

Distribution and habitat

Found as a common weed in cultivated fields and wastelands throughout most of India to an altitude of 1800 m in the Himalayas.

Medicinal properties and uses

The plant is considered to be stimulant, diaphoretic, laxative, anthelmintic, antiseptic and insecticidal. In Ayurveda the whole plant is used to treat bronchitis, jaundice, inflammations, asthma, dyspepsia, paralysis, intermittent fevers and skin diseases; the leaves are used to treat urinary discharges. Among the Kols of Banda District in Uttar Pradesh, a decoction of the plant is used to treat malarial fever; they also use the leaf ash, mixed with horse urine, as a local application to promote healing of old boils. The fresh juice is used in some localities as an external application to treat scabies. The leaf juice, sometimes mixed with honey, is used to treat coughs and colds among the Santhalis in southern Bihar and by rural inhabitants of Bhavnagar District in Gujarat, where it is also used for treating jaundice. Among the Gonds of Uttar Pradesh, the extract of the seed is used by women as an oral contraceptive. A syrup prepared from the flowers is used as a home remedy for coughs and colds.

References

Bhatt and Mitaliya (1999), Chopra *et al.* (1956), CSIR (1948–1992), Jain *et al.* (1989), Kirtikar *et al.* (1935), Varma (1997), Yoganarasimhan (1996).

Leucas plukenetii (Roth) Spreng.

Botanical synonyms

Leucas aspera Link., *Phlomis plukenetii* Roth

Common names

Bengali: chotahalkusa; ***Hindi***: chota halkusa; ***Kannada***: olle thumbe, thumbe gida, tumpa; ***Malayalam***: thumba; ***Marathi***: tamba; ***Oriya***: bhutamari; ***Sanskrit***: dronapushpi, dronapuspi; ***Tamil***: thumbai, tumbai; ***Telegu***: tummachettu, tummi.

Description

A fragrant, much-branched, erect or diffuse annual herb 15–60 cm high with hispid,

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quadrangular branches. Leaves opposite, 2.5–7.5 cm long and 0.6–1.3 cm wide, linear or narrowly oblong-lanceolate with a tapering base, margins entire or crenate, more or less hairy; petioles 2.5–6 mm long. Flowers small, white, in dense terminal or axillary whorls up to 2.5 cm in diameter; bracts *c.* 6 mm long, linear, acute, bristle-tipped, ciliate; calyx variable, 8–13 mm long tubular, ribbed, mouth obliquely curved, teeth small, triangular; corolla 1 cm long, 2-lipped, upper lip 3 mm long, densely white-woolly, lower lip twice as long as the upper, 3-lobed, tube 5 mm long, enlarged and pubescent above, annulate about the middle. Fruits (nutlets) oblong, 2.5 mm long, inner face sharply angular, the dorsal face rounded, smooth, brown. Flowers and fruits between September and December.

Distribution and habitat

Native to tropical Asia from India and Bangladesh to Mauritius, Indochina and Malesia. It is found as a weed in cultivated fields, along roads and in wasteland throughout most of the plains of India up to about 900 m elevation.

Medicinal properties and uses

In Ayurveda the whole plant is considered antihistaminic, antipyretic, antiseptic, carminative, vermifuge and febrifuge; it is used to treat anorexia, cough, dyspepsia, fever, intestinal worms and respiratory diseases; the fresh juice of the plant is extensively used for treating jaundice and skin diseases. In Siddha practice, the leaves and flowers are reportedly used to treat fever, eye diseases, snake-bite poisoning, nasal disorders, coryza, cough, leucorrhoea and venereal diseases. The powdered seeds mixed with an edible oil are used as a local application to relieve eczema among the inhabitants of Bhadrak District in north-eastern Orissa. The plant is commonly used as an antipyretic in villages in South India. The leaves are said to be useful for treating chronic rheumatism; the leaf paste is applied to the forehead to relieve headaches by the Todas of Tamilnadu. Among the tribal inhabitants of Udaipur District in Rajasthan, a hot poultice of the leaves is used to treat abdominal pains and gastric disturbances; in this region, the leaf paste is used to treat leprosy. The leaf juice is applied externally to relieve psoriasis, chronic skin eruptions and painful swellings; among the tribal inhabitants of eastern Bihar, it is taken orally to treat coughs and colds. In Bastar (Madhya Pradesh) the juice of the roots is used as a nosedrop as a remedy for hemicrania. The Irulars of Tamilnadu use the thick roots as a toothbrush to increase resistance to snake-bite poisoning. In northern Bengal, the flowers are given with honey to treat coughs and colds in children.

References

Chopra *et al.* (1969), CSIR (1948–1992), Girach *et al.* (1997), Jain *et al.* (1989), Jha and Varma (1996), Katewa and Arora (1997), Kirtikar *et al.* (1935), Ragupathy and Mahadevan (1991), Sivarajan and Balachandran (1994), Yoganarasimhan (1996).

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Leucas zeylanica (L.) R. Br.

Common name

Kannada: huchhu thumbe.

Description

An erect, pubescent or hispidly hairy annual herb up to 50 cm tall with grooved, quadrangular branches. Leaves opposite, 2.5–7.5 cm long and 0.8–1.3 cm wide, linear or linear-lanceolate, apex obtuse, margins entire or slightly serrate, often slightly recurved, hispid on both sides, base tapering, midrib conspicuous beneath. Flowers white, sessile or nearly so, borne in terminal whorls 1.3–2 cm in diameter; bracts 6 mm long, linear, spinous-pointed, ciliate; calyx 6 mm long, turbinate, upper tooth of the calyx longer than the others, triangular, acute; corolla 2 cm long, tube 6 mm long, the upper part enlarged, pubescent, upper lip 5 mm long, densely white-woolly, the middle lobe broadly obovate, lateral lobes very small. Fruits (nutlets) small, obovoid-oblong, dark brown or black, shining.

Distribution and habitat

Found as a weed in riverbeds and wastelands in Gujarat and in western and southern regions of peninsular India to an elevation of 1200 m; also occurs naturally in northeastern India and Bangladesh, Sri Lanka, Malaysia and southern China.

Medicinal properties and uses

The herb is reportedly used to relieve fevers and skin diseases in Indonesia; its decoction is used as a lotion to treat ulcers in the nose. In Sri Lanka, the leaf juice is used to treat headache and colds.

References

CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

Ocimum americanum L.

Botanical synonyms

Ocimum album L., *O. basilicum* L.

Common names

Bengali: babuitulsi, debunsha, khubkalam, pashanabeddie; ***English***: common basil, sweet basil; ***Gujarati***: damaro, nasabo, sabje, takamariya; ***Hindi***: babuitulsi, bahari, barbar, kalitulsi, sabzah; ***Kannada***: kamakasturi, ramkasturi, sajjebiya; ***Malayalam***: kattutulasi, pachcha, tirunitru; ***Marathi***: marva, sabja, sabza, tukhamariya; ***Oriya***: dhalatulasi; ***Punjabi***: babri, furrunjnushk, nigand, tulsi; ***Sanskrit***: arjaka, arjakah, barbari; ***Tamil***: tirnutpatchi, tirunitru; ***Telegu***: bhutulasi, rudrajada, vepudupachha, vibudipatri; ***Urdu***: janglitulasi.

Description

An erect, much-branched, sweet-scented herb up to 90 cm high; stems and branches

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green or sometimes purplish. Leaves 2.5–5 cm long and 1–2.5 cm wide, ovate, apex acute, margins entire or faintly toothed or lobed, base cuneate; petioles 1.3–2.5 cm long. Flowers borne in more or less closely set whorls in spicate racemes up to 20 cm long; bracts stalked, shorter than the calyx, ovate, acute; calyx 5 mm long, enlarging in fruit, lower lip with the 2 central teeth longer than the rounded upper lip; corolla 8–13 mm long, white, pink or purplish. Fruits (nutlets) *c.* 2 mm long, narrowly ellipsoid, black, pitted, mucilaginous when wet.

Distribution and habitat

Very common, often abundant near cultivated fields and on wastelands in the plains and lower hills in most parts of India. Also found in Sri Lanka, Java, western Asia and tropical Africa.

Medicinal properties and uses

In Ayurveda, the plant is considered stomachic, anthelmintic, alexipharmic and antipyretic; it is used to treat diseases of the heart and blood, biliousness, leucoderma and itching. In Unani medicine, it is considered diuretic and emmenagogue, and is used to treat diseases of the heart and brain, chronic joint pain, inflammation, enlarged spleen and asthma; the juice is considered useful for treating toothache, earache and headache, and mixed with camphor it is used to stop nosebleeds. A decoction of the plant is taken internally to relieve coughs and fever, and that of the leaves for treating dysentery, and as a mouthwash for relieving toothache. The leaves, widely used for flavouring sauces, soups and salads, are considered diuretic and tonic. The leaf paste is used externally for treating parasitic skin diseases. The leaf juice is a popular remedy for ringworm, and is also given to children for treating cold, catarrh and bronchitis. In northeastern Karnataka the leaves, mixed with black pepper (fruits of *Piper nigrum*: *Piperaceae*) and garlic (*Allium sativum*: *Liliaceae*), are given to patients to overcome fits. An infusion of the seeds is used to treat gonorrhoea, diarrhoea and chronic dysentery; their decoction is used as an eyewash to relieve inflammation among the Kondhs of southwestern Orissa. A cold infusion of the seeds is reportedly used by rural inhabitants of Bhavnagar District in Gujarat to treat painful urination. The plant yields a volatile oil that is used as a perfume for soaps and cosmetics.

References

Bhatt *et al.* (1999), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Girach (1992), Kirtikar *et al.* (1935), Seetharam *et al.* (1999), Shah and Singh (1990), Yoganarasimhan (1996).

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Ocimum gratissimum L.

Common names

Bengali: bantulsi, ramtulsi; ***English***: lemon basil, shrubby basil, tea bush; ***Gujarati***: avachibavachi, ramtulasi; ***Hindi***: bantulsi, malatulsi, ramtulsi; ***Kannada***: nimbe tulasi, nimma tulasi, rama tulasi; ***Malayalam***: kattutrittavu, ramatulasi; ***Marathi***: ramatulasi, ranatulasu; ***Oriya***: ramotulosi, sondabhogohulono; ***Punjabi***: banjere; ***Sanskrit***: ramatulsi, vriddhatulasi; ***Tamil***: elumichantulasi, peruntulasi; ***Telegu***: nimmatulasi, ramatulasi; ***Urdu***: ramtulasi.

Description

A tall, much-branched perennial shrub, generally 1.2–1.8 m tall, more strongly scented than other species of the genus; stem and branches subquadrangular, woody below. Leaves 6.3–12.5 cm long and 3.8–5.7 cm wide, elliptic-lanceolate, apex acute, base cuneate, margins coarsely crenate-serrate, gland-dotted, pubescent on both surfaces; petioles 2.5–6.3 cm long. Flowers pale greenish-yellow, borne in simple or branched racemes, moderately closely whorled; bracts sessile, longer than the calyx; calyx 3 mm long in flower and to 6 mm long in fruit, pubescent and glandular, upper lip rounded, veined, curved upwards in fruit, longer than the lower; corolla 4 mm long, pubescent outside, upper lip 3 mm broad with 4 rounded teeth, lower lip longer than the upper, *c.* 1.2 mm broad. Fruits (nutlets) subglobose, 1.5 mm in diameter, rugose, brown with glandular depressions, not mucilaginous when wetted.

Distribution and habitat

A widely distributed palaeotropical species of unknown origin, found almost throughout India as a common weed by roadsides and in waste places; often cultivated.

Medicinal properties and uses

The plant is considered digestive, tonic, stimulant, demulcent, diuretic, anti-emetic, antiseptic and styptic. In Ayurveda the plant is used to treat skin diseases, erysipelas, inflammations and strangury. In Unani practice, the plant is considered carminative and aphrodisiac and used to treat diseases of the brain, heart, liver and spleen, to relieve griping and piles, and to strengthen gums. In Siddha, the whole plant is used as a carminative and diuretic, and to relieve swellings, abscesses, arthritis and coughs. It is used in cough mixtures in combination with other expectorants. Aromatic baths using fumigations prepared from the plant are recommended for the treatment of rheumatism and paralysis. A decoction of the leaves is considered a useful remedy for gonorrhoea and for seminal weakness. The leaf juice is sometimes given to relieve stomach-ache. The seeds are taken to relieve headache, neuralgia and dysentery; their infusion is used to treat urinary disorders. The volatile oil extracted from the plant acts as a local anaesthetic and is used externally to relieve inflamed joints and other chronic inflammatory conditions. The oil is also used to relieve earache, toothache and abdominal colic in children.

References

Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

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Ocimum sanctum L.

Botanical synonym

Ocimum inodurum Burm.

Common names

Bengali: kalatulsi, kural, tulshi, tulsi; ***English***: holy basil, sacred basil; ***Gujarati***: talasi, tulasi, tulsi; ***Hindi***: baranda, kalatulsi, tulsi, vranda; ***Kannada***: kalatulasi, karitulasi, sritulasi, tulasi, vishnutulasi; ***Konkani***: tulsi; ***Malayalam***: krishnatulasi, trittavu, tulasi; ***Marathi***: tulasa, tulasichajadha; ***Punjabi***: bantulsi, tulsi; ***Sanskrit***: ajaka, ramatulasi, tulasi, vriddhatulasi; ***Tamil***: tulasi; ***Telegu***: krishnatulasi, tulasi.

Description

An erect, much-branched, strongly aromatic, softly hairy, annual herb generally up to 60 m high; stems and branches usually purplish, subquadrangular. Leaves elliptic-oblong, 2–5 cm long and 1–3 cm wide, apex obtuse or acute, base obtuse or acute, margins entire or serrate, softly pubescent on both sides, minutely gland-dotted; petioles 1.3–2.5 cm long, slender, hairy. Flowers small, purplish or crimson, borne in close-whorled racemes 15–20 cm long; bracts to 3 mm long and almost as wide, broadly ovate, ciliate; pedicels longer than the flowering calyx; calyx purplish, 3–4 mm long in flower, to 5 mm in fruit, 2-lipped, pubescent, upper lip orbicular, reflexed, lower lip 4-lobed; corolla 4 mm long, 2-lipped, upper lip pubescent on the back. Fruit a minute, subglobose or broadly ellipsoid, slightly compressed, dry nutlet enclosed in the enlarged membranous calyx, nearly smooth, pale brown or reddish with small black markings, mucilaginous when wet. Two types are cultivated in India, the more common bearing green leaves, the second with purple leaves. In central India, flowering and fruiting occur mainly between July and October.

Distribution and habitat

Occurs naturally from India and Sri Lanka eastwards through Southeast Asia to Malesia. It is found in all plains districts in India, mostly under cultivation. The plant is held sacred by Hindus and is grown in pots on pedestals in homes and in temples throughout India.

Medicinal properties and uses

In Ayurveda the leaves, flowers and occasionally the whole plant are used medicinally in the treatment of heart and blood diseases, leucoderma, strangury, asthma, bronchitis, lumbago and purulent discharges of the ear. The leaf juice possesses diaphoretic, antiperiodic, stimulant and expectorant properties; it is used to treat infantile cough, cold, catarrh, bronchitis, diarrhoea and dysentery, and is applied to the skin to treat ringworm and other skin diseases, and as an eardrop to relieve earache. In southern West Bengal, a paste prepared from the leaves mixed with roots of *Calotropis procera* (*Asclepiadaceae*) is taken to treat menorrhagia. An infusion of the leaves is used as a stomachic for gastric disorders in children. A decoction of the root is given as a diaphoretic in the treat-

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ment of malarial fevers. The seeds are mucilaginous and demulcent and prescribed for genito-urinary disorders. The oil extracted from the leaves by steam distillation is reported to possess antibacterial and insecticidal properties, and is particularly effective as a mosquito repellent.

References

Chopra *et al.* (1956, 1969), CSIR (1948–1992), Ghosh and Sensarma (1997), Kirtikar *et al.* (1935), Sivarajan and Balachandran (1994), Yoganarasimhan (1996).

Pogostemon benghalense (Burm. f.) O. Kuntze

Botanical synonyms

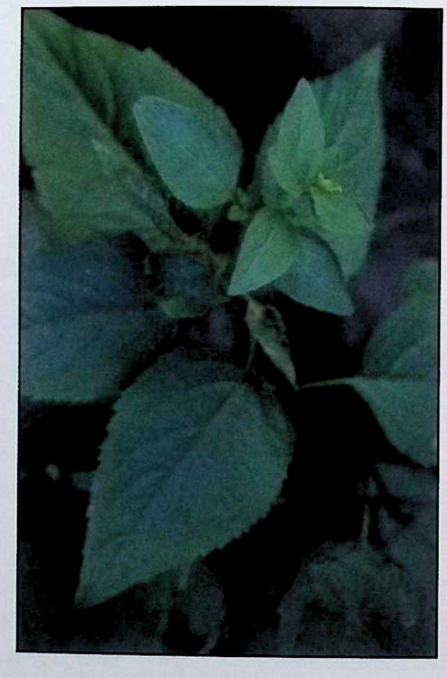
Origanum benghalense Burm. f., *Pogostemon plectranthoides* Desf.

Common names

Bengali: bakoha, jin, juilata; ***Konkani***: pangla; ***Oriya***: badagandhuri, dumobadotoko, gondripulu, poksunga; ***Telegu***: kusurijang.

Description

An erect, strongly aromatic shrub up to 2 m tall; branches round or subquadrangular, hoary-pubescent when young, often dark purple. Leaves opposite, 5–13 cm long and 3–7 cm wide, ovate, apex acute, base rounded or cuneate, margins crenate-serrate, pubescent on both surfaces; petioles 1.3–3.2 cm long. Flowers small, white, pinkish or purple with purple stamens, borne in many-flowered whorls in whitish-pubescent paniculate spikes forming a large terminal panicle; bracts up to 8 mm long, foliaceous, broadly ovate, acute, pubescent and ciliate, enclosing a fascicle of sessile flowers intermixed with membranous bracteoles of varying sizes, mostly linear-lanceolate, often tinged with purple; calyx 4–5 mm long, slightly obconic, pubescent and glandular, teeth lanceolate, acute, ciliate; corolla 8 mm long, tube slender, 5 mm long, cylindrical. Fruit minute, *c.* 0.8 mm long, broadly ellipsoid, smooth, shining, comprising 4 minute nutlets, brown-black when ripe. Flowers in January and February in central India.



Distribution and habitat

Found throughout most of peninsular India, in Bihar and West Bengal and in the western Himalayas to an altitude of about 1500 m. Common and frequently gregarious in shady and moist habitats such as ravines or along streams in central India, and in open habitats in deciduous forests of southern India to an elevation of about 900 m.

Medicinal properties and uses

The leaves, which are slightly pungent in taste and have a strong odour of blackcurrants, are used as a stimulant and styptic. The leaf juice is reportedly used for treating

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colic and as a febrifuge. The roots are considered stimulant and antihaemorrhagic; their paste is used as an external application to alleviate fever in children among the Paudi Bhuinya of northern Orissa. The paste of the plant is taken internally to relieve body pains by the inhabitants of the Gandhamardan Hills in Orissa.

References

Aminuddin and Girach (1996), Brahmam and Saxena (1990), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

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Lauraceae

Cinnamomum camphora J. Presl.

Botanical synonym

Camphora officinarum Nees ex Wall.

Common names

Bengali: karpur; ***English***: camphor tree; ***Hindi***: karpur; ***Kannada***: chandra, dhavala, karpura, kumada, pachakarpura, tuhina; ***Malayalam***: ghanarasam, himasu, himavaluka, sitamsu; ***Oriya***: chondrongyon, ghonosaro, kopuro; ***Sanskrit***: karpura; ***Tamil***: indu, karppuram; ***Telegu***: chandrumu, gambura, himavaluka, kappuramu, sitabhramu.

Description

A large, handsome evergreen tree up to 30 m tall; bark and leaves aromatic. Leaves alternate, long-petioled, glabrous, somewhat leathery, ovate-oblong to lanceolate-oblong, 3–12 cm long and 1–5 cm wide, attenuate-acute at both ends, usually 3-nerved. Flowers yellow, about 0.3 cm long, borne in many-flowered, slender axillary panicles, peduncle thin, branching at apex; calyx yellow, slightly longer than the pedicel, *c.* 3 mm long, lobes slightly tomentose inside. Fruits (berries) 1-seeded, globose, 0.5–1 cm in diameter, seated on a shallow, thin cup, turning black when ripe. Flowers between March and April in northern India; fruits ripen in October.

Distribution and habitat

Native to China, Taiwan and Japan; introduced and cultivated in India as an ornamental and as a source of camphor.

Medicinal properties and uses

The leaves and aromatic oil (*camphor*) distilled from the bark and wood are credited

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with sedative, diaphoretic, anodyne, antiseptic, antispasmodic, expectorant, analgesic and anthelmintic properties. When inhaled, camphor vapour is useful for treating colds and related chest affections. A liniment prepared by dissolving camphor in olive oil (1 : 4 parts) is used extensively as an external application as a counter-irritant to relieve inflammations, bruises and sprains. In Ayurveda, camphor is used to treat leprosy, boils, worm infestation and diseases of the throat. In Siddha it is used to treat convulsions and as an analgesic. It is also used in insecticidal preparations. Camphorated oils are used worldwide to relieve rheumatic pain and inflammation, fibrositis and neuralgia.

References

Asolkar *et al.* (1992), Chatterjee and Pakrashi (1991), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

Cinnamomum verum J.S. Presl.

Botanical synonyms

Cinnamomum zeylanicum Blume, *Laurus cinnamomum* L.

Common names

Bengali: dalchini, qalamidarchini; ***English***: cinnamon; ***Gujarati***: taj; ***Hindi***: dalchini, qalamidarchini, tvakh; ***Kannada***: dalchini, lavangapatte, nisane, tejadalachini; ***Konkani***: tiqui; ***Malayalam***: cheriyilaivannam, erikkolam, etuna, ilavangam, karuva, vazhana; ***Marathi***: dalchini, darachini; ***Oriya***: dalochini, daruchini, gudotwoka, tapinchchha; ***Punjabi***: darchini, kirfa; ***Sanskrit***: tamalapatra, tvacha, tvak; ***Tamil***: cannalavanagpattai, ilavangam, karuva, pulambilavu, sorachattorachi; ***Telegu***: aakerpatri, lavanagamu, lavangapatta, sanalinga, sannalavanga; ***Urdu***: darchini.

Description

A medium-sized tree up to 16 m tall; bark smooth, thin, pale brown, with a strong, pleasant (*cinnamon*) smell. Leaves opposite, coriaceous, rose-coloured when young, turning shiny green, 3–5-ribbed with prominent venation, ovate or ovate-lanceolate, 7.5–20 cm long and 3.8–7.5 cm wide, acute or acuminate at apex, acute or rounded at base; petioles 1.3–2.5 cm long, flattened above. Flowers numerous, *c.* 0.5 cm across, fetid-smelling, yellowish-green or white, borne in silky-pubescent, lax, axillary panicles; peduncles long, often clustered; pedicels long; perianth 5–6 mm long, tube 2.5 mm long, segments pubescent on both sides. Fruit (berry) ellipsoid to oblong-ovoid, green turning dark purple when ripe, up to 1.3 cm long, single-seeded. Flowers and fruits between December and July in southern India.

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Distribution and habitat

Believed to be indigenous to Sri Lanka, but found in its natural state in moist and wet coastal and lower montane forests of south-western India from western Karnataka through Kerala, as well as in Myanmar (Burma). In India it is cultivated mainly in Tamilnadu, Karnataka and Kerala and to a limited extent in eastern India for its bark and leaves, which are used as spices.

Medicinal properties and uses

The aromatic bark, particularly the inner bark, is used extensively in traditional Indian medicine as an astringent, stimulant, expectorant and carminative. As a stimulant it is useful for relieving stomach cramps, gastric irritation, nausea and paralysis of the tongue. It is reportedly used as a flu-preventative and to treat gonorrhoea, tuberculosis, enteric fever and, in the form of a dilute tincture, for treating menorrhagia. Ground cinnamon shows lipolytic activity and is useful for treating diarrhoea and dysentery. Externally the bark or leaf oil is used to relieve neuralgia, headache, rheumatism and toothache. A decoction of the bark is reportedly used to treat cancer of the stomach, rectum and uterus. In Ayurveda the bark is used to treat biliousness, bronchitis, diarrhoea, itching, diseases of the heart, rectum and urinary system; the oil is considered styptic and carminative. In Unani medicine the oil is considered carminative, emmenagogue and tonic to the liver, and is used to treat inflammations, abdominal pains and bronchitis.

References

Asolkar *et al.* (1992), Chatterjee and Pakrashi (1991), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935), Rao *et al.* (1996), Yoganarasimhan (1996).

Laurus nobilis L.

Common names

English: sweet bay, true laurel.

Description

A small evergreen tree with smooth, dark grey bark. Leaves elliptic to ovate, up to 10 cm long, pointed at the tip, margins wavy, glossy dark green above, paler beneath, smooth, leathery, aromatic when crushed. Flowers yellow (male) or green (female), about 1 cm across, borne in axillary clusters. Fruit (berry) ovoid, about 1 cm long, green ripening to black and coarsely wrinkled, single-seeded.

Distribution and habitat

Native to the Mediterranean region of Europe; sometimes cultivated in Indian gardens.

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Medicinal properties and uses

The leaves and fruits possess aromatic, astringent, stimulant, stomachic and narcotic properties. They were formerly used to treat hysteria, amenorrhoea and flatulent colic. A decoction of the leaves is reportedly used to treat leucorrhoea, diseases of the urinary tract, and dropsy; it is also a powerful emmenagogue. The oil extracted from the seeds after boiling in water, known commercially as *Oil of Laurel Berry*, is sometimes used externally as a stimulant to relieve sprains and rheumatic pains.

References

Chopra *et al.* (1956, 1969), CSIR (1948–1992), Nadkarni (1954).

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Lecythidaceae

Barringtonia acutangula (L.) Gaertn.

Botanical synonyms

Barringtonia edaphocarpa Gagnep., *B. pedicellata* Ridley, *B. spicata* Blume, *Stavadium acutangulum* (L.) Miers

Common names

Bengali: hijal, hijalo, hijjala, kumia, samundar; ***English***: Indian oak; ***Gujarati***: samudraphal, samundraphala; ***Hindi***: hijal, ingar, meora, naliya, paniha, samudarphal; ***Kannada***: holekauva, hole kowa mara, mauvinkubia, mavinkubia, niruganigily; ***Konkani***: nivar; ***Malayalam***: attampu, attupera, nirppera, nirperzha; ***Marathi***: dattephal, ingli, piwar, samudraphal, tivar; ***Oriya***: hijal, hinjal, hinjolo, nijhira; ***Sanskrit***: hijjala, ijul, nicula, niculah, samudraphala; ***Tamil***: adampa, kadappai, sengadambu; ***Telegu***: buddadarni, kadapa, kanapa, kurpa, punnagachettu; ***Urdu***: samandarphala.

Description

A small evergreen tree up to 12 m tall; bark rough, dark grey, longitudinally furrowed. Leaves crowded at the ends of branchlets, 6.4–15 cm long and 3.3–8.4 cm wide, elliptic, obovate or oblanceolate, apex rounded, acute or acuminate, base narrowed into a short petiole, margins entire or minutely denticulate-crenate, glabrous, pale beneath. Flowers fragrant, dark scarlet, 8–13 mm across, born in slender, pendulous, many-flowered racemes 15–38 cm long; pedicels 1.5–3 mm long; bracteoles linear-lanceolate, acute; calyx 5 mm long, tube about as long as the lobes, lobes 4, oblong, rounded, ciliolate; petals 4–5, 5 mm long; stamens bright red, in 3 whorls. Fruits ovoid, bluntly quadrangular, 2–6 cm long and 1–2.5 cm wide, broadest in the middle, narrowed at each end, crowned by the small, persistent calyx. In central Indian deciduous forest areas flowering usually occurs from March to May; fruits mature in September and October.

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Distribution and habitat

Widespread in tropical and subtropical Asia from Afghanistan and Pakistan southwards and eastwards through India, Bangladesh, Myanmar (Burma), Sri Lanka, Thailand and throughout the Malesian region to northern Australia. In India it is fairly common in seasonally flooded forests from the Jumna eastwards to Assam, and in West Bengal, Bihar, Madhya Pradesh, Orissa and southern India. Typically found along streambanks, irrigation channels, around the edges of marshes, and near the sea coast. Often planted for ornament.

Medicinal properties and uses

In Ayurveda the tender, edible leaves and the leaf juice are given to treat diarrhoea and dysentery. The fruit is considered astringent to the bowels, vulnerary, alexipharmic and anthelmintic; it is used to treat biliousness, diseases of the blood, bronchitis, sore eyes, headache and hallucinations. In Unani practice the fruit is considered useful for treating gleet, abdominal colic, lumbar pain, syphilis and nasal catarrh. The fruits are also used to treat gingivitis and for healing wounds. They are rubbed with water and locally applied to the chest as a decongestant, to the abdomen to relieve colic and flatulence, and to the eyes for treatment of epiphora. The powdered seeds mixed with water are given to children as an emetic and expectorant, and, among the Santhalis of Mayurbhanj District in Orissa, for treating liver disorders. The powder can be inhaled as snuff for relief of headaches. The root is considered aperient, cooling, emetic, expectorant and a bitter tonic, and is used in western peninsular India alone or in combination with other medicines as an external applications in colds; it reportedly possesses properties similar to those of *Cinchona* (*Rubiaceae*). The bark is astringent and used to treat fever, diarrhoea and blennorrhoea, and is reportedly useful in the treatment of gonorrhoea. It is applied externally for relief from bites and stings of insects. A decoction of the bark is used as a mouthwash to relieve toothache and gum trouble. The wood is used as a haemostatic in cases of menorrhagia. Both the seeds and bark are used as a fish poison.

References

Asolkar *et al.* (1992), Chatterjee and Pakrashi (1995), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Jain *et al.* (1989), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

Careya arborea Roxb.

Botanical synonym

Careya coccinea sensu Alston

Common names

Bengali: kamba, kumbhi, kumbi, vakamba; ***English***: kumbi, patana oak, slow-match tree, wild guava; ***Gujarati***: kumbi; ***Hindi***: agiya, kamba, kumbh, kumbhi, kumbi, kumin, vakamba; ***Kannada***: doddala, ganjal, gaul, gavuldu, goddadayippe, kaval, pilu; ***Konkani***: kumbio; ***Malayalam***: alam, pelu, perzha, pezha; ***Marathi***: kuba, kumbha, kumbia, vakumbha; ***Oriya***: kumbhi; ***Punjabi***: vakhumba; ***Sanskrit***: kumbhi, padmaka; ***Tamil***: ayma, kalkambi, karekku, kolama, kumbi, pelu; ***Telegu***: araya, duddippa, dudippi, godava, govadi, kumbhi.

Description

A handsome deciduous tree up to 20 m tall with a spreading crown; bark thick, dark grey or brown, fissured, exfoliating in thin, rectangular flakes or strips. Leaves red when young, arranged spirally, clustered at the tips of branchlets, 15–30 cm long and 7.5–18 cm wide, broadly obovate or oblanceolate, apex rounded, obtuse or shortly acuminate, margins crenate-denticulate, base narrowed to a short petiole less

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than 2 cm long; lateral nerves 10–15 pairs, forming loops near the margins, prominent. Flowers 6.3–9 cm across, white, pink or yellowish-white, fetid, borne in thick, swollen, erect terminal spikes 6.4–10 cm across, each with a central elliptic bract and 2 linear lateral bracts; calyx *c.* 2.5 cm long, tube campanulate, lobes 4, oblong, obtuse, stiff, erect; petals 3.8–5 cm long, elliptic-oblong, obtuse or subacute. Fruits (berries) globose or ovoid, 5–7.5 cm in diameter, green, fetid, crowned with persistent calyx; seeds numerous, approximately 1 cm long, pale brown, embedded in fleshy, edible pulp. Flowers from January to May depending on locality; fruits mature between April and July. In central India trees remain leafless between January–February and April.

Distribution and habitat

A tropical Asian species occurring naturally from Afghanistan and Pakistan southwards and eastwards through India, Nepal, Bangladesh, Myanmar (Burma), Sri Lanka, the Andaman Islands, Indochina, Thailand and peninsular Malaysia. It is found scattered but often locally common in open habitats in moist and dry deciduous forests on well-drained, sandy or even rocky soils throughout most of India up to an altitude of 1500 m. It is occasionally planted in gardens and along roads for its shade as well as its showy flowers and fruits.

Medicinal properties and uses

In Ayurveda the bark is considered alexiteric, anthelmintic and useful for treating tumours, dyspepsia, colic, bronchitis, urinary discharges, piles, leucoderma, skin diseases and epilepsy. It is also used in traditional medicine as a demulcent to treat coughs and colds, and as an antipyretic and antipruritic for treating eruptive fevers (par-

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ticularly in smallpox and snake bite). A paste made from the stem bark is applied as an ointment to relieve eye inflammation among the Kondhs of southwestern Orissa. The aqueous extract of the bark mixed with curd (yoghurt) is used elsewhere in Orissa as a remedy for dysentery. A decoction of the bark is used for washing and cleaning abscesses, boils and ulcers, as an eyewash and, taken internally, for treating diarrhoea. Among the tribal inhabitants of southern Bihar, the crushed stem bark, soaked for 2 days in water, is applied to promote healing of tongue ulcers. The fruits are aromatic, astringent and demulcent; their decoction is used as a digestive. The dried calyces (trade name: *Vakumbha*) are tonic and demulcent. An infusion of the flowers is given after childbirth as a tonic and to heal perianal tears. The juice of both the flowers and fresh bark, mixed with honey, acts as a demulcent for colds and coughs. The leaves are applied as a poultice to promote healing of ulcers. The cooked fruits are edible, and the tender leaves are reportedly eaten as a vegetable.

References

Asolkar *et al.* (1992), Chatterjee and Pakrashi (1995), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Girach (1992), Girach and Aminuddin (1995), Jain *et al.* (1989), Kirtikar *et al.* (1935), Mukherjee and Namhata (1990), Upadhye *et al.* (1994).

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Leeaceae

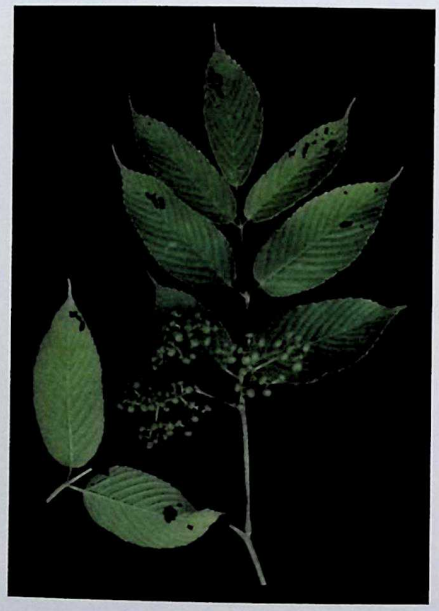
Leea asiatica (L.) Ridsdale

Botanical synonyms

Leea aspera Edge., *L. crispa* L., *L. edgeworthii* Santapau, *L. herbacea* Ham., *L. pumila* Kurz, *Phytolacca asiatica* L.

Common names

Bengali: banchalita; ***Kannada***: kaadumari drakshi; ***Malayalam***: nalugu, nellu; ***Oriya***: hatikanopotro.



Description

A perennial shrub up to 2.5 m tall with furrowed stems and branches; stems, branches, peduncles and petioles with 6–8 short, crisp wings. Lower leaves bipinnate, upper simple pinnate, 3–7-foliate; leaflets 10–18 cm long and 3.8–7.5 cm wide, oblong or oblong-lanceolate with short, stiff hairs above, apex acute or acuminate, base usually rounded, margins sharply serrate with bifurcation of the 12–20 pairs of the main lateral nerves running into the teeth; petiolules of the lateral leaflets 3–12 mm long, those of the terminal leaflets longer. Flowers greenish-whitish or pale yellow, borne in leaf-opposed, corymbose cymes; bracts linear-subulate, 6–8 mm long; bracteoles 3 mm long, lanceolate; calyx lobes triangular, gland-tipped; petals oblong. The edible fruits (berries) 2–6-lobed, depressed-globose, 6–8 mm in diameter, dark grey or black when ripe. In central India, flowering occurs between July and September and fruiting from October to December; plants die back after fruiting and reappear in June.

Distribution and habitat

Found in northeastern India, western tropical Himalyas and in the western and southern regions of peninsular India. Common in hedges, wastelands and in forest undergrowth on good soils.

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Medicinal properties and uses

The root tubers are used to expel guinea worms, and the bruised leaves are applied externally to promote healing of wounds. In Ayurveda, the root is reportedly used to treat cardiac diseases, leprosy, poisoning and erysipelas.

References

Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

Leea macrophylla Roxb. ex Hornem.

Botanical synonyms

Leea angustifolia Lawson, *L. cinerea* Lawson, *L. coriacea* Lawson, *L. diffusa* Lawson, *L. integrifolia* Roxb., *L. latifolia* Wall. ex Kurz, *L. parallela* Wall. ex Lawson, *L. robusta* Roxb., *L. talbotii* King ex Talbot, *L. venkobarowii* Gamble

Common names

Bengali: dholsamudra, tulsamudra; ***Hindi***: dholsamudra, hatkam, samudraka; ***Marathi***: dinda; ***Sanskrit***: dholasamudrika.

Description

An erect herbaceous plant 60–90 cm tall with tuberous perennial roots. Leaves few, simple, nearly as wide as long, the lower leaves up to 60 cm long, the upper 15–23 cm long, broadly ovate, base cordate, apex acute or acuminate, margins coarsely serrate or sublobed; petioles 5–12.5 cm long, deeply striate. Flowers small, white, borne in terminal corymbose cymes up to 30 cm long; calyx lobes triangular-ovate, tipped with a hard small point; petals oblong. The edible fruits (berries) are depressed-globose, usually 3–6-lobed, black when ripe. In central India flowering occurs between July and September and fruiting in October and November; plants yellow and die back after fruiting (in December) and reappear in June.

Distribution and habitat

Found throughout tropical India eastwards to Thailand and Laos; in peninsular India it is common in the understorey of dry and moist deciduous forests.

Medicinal properties and uses

The deep red, mucilaginous, astringent, root (tuber) is credited with anodyne properties. It is pounded and applied to promote healing of wounds and sores and used to treat ringworm and guinea worms. In Ayurveda, the root is considered a good alexipharmic; it is also used to treat cardiac diseases, leprosy, poisoning and erysipelas The root juice, diluted with water, is taken orally to relieve diarrhoea by the Gonds and Kolams of northern Andhra Pradesh. The leaves of the plant are eaten as a vegetable.

References

Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Ravisankar and Henry (1992), Yoganarasimhan (1996).

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Liliaceae

Urginea indica (Roxb.) Kunth.

Botanical synonym

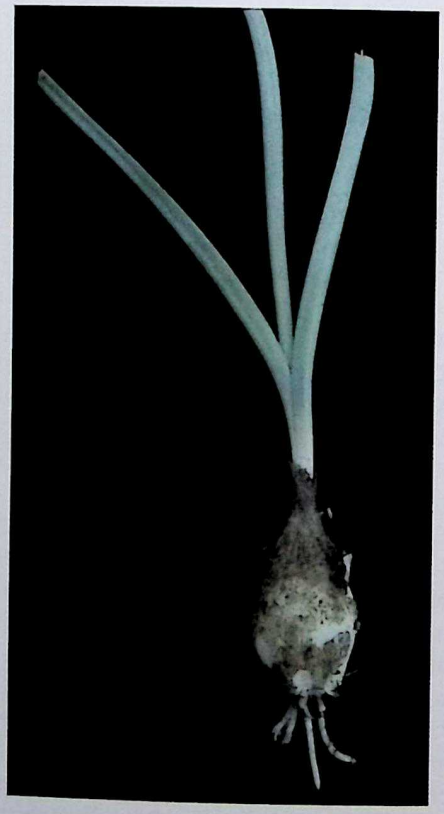
Scilla indica Roxb.

Common names

Bengali: banpiaaj, jangli piyaz, kande; ***English***: Indian squill; ***Gujarati***: janglikanda, pankando, rankando; ***Hindi***: ban piyazi, jangli piyaz; ***Kannada***: adairirulli, kaadu bellulli; ***Malayalam***: kanthanga, kattulli; ***Marathi***: janglipyajha, ranachakande, rankanda; ***Punjabi***: kachwassal, phaphor; ***Sanskrit***: kolkanda, vanapalandan; ***Tamil***: narivengayam; ***Telegu***: adavithellagadda, nakkavalligadda; ***Urdu***: janglipiyaz.

Description

A small, glabrous herb with a pale, ovoid or pear-shaped bulb 5–10 cm long. Leaves linear, 15–45 cm long and 1.3–2.5 cm wide, nearly flat, apex acute, appearing after the flowers. Scape erect, brittle, 30–45 cm long and 4–6 mm in diameter at the base. Flowers greenish-white, brownish or purplish, drooping or spreading in terminal racemes 15–30 cm long; bracts minute; pedicels 2.5–3.8 cm long, slender; perianth campanulate, segments 1 cm long and 2.5–3 mm wide, oblong-lanceolate, obtuse, with 2–3 nerves down the middle. Fruits (capsules) ellipsoidal or oblong, tapering to both ends, 1.3–2 cm long, the cells 6–9-seeded; seeds flattened, black, *c.* 6 mm long and 3 mm wide.



Distribution and habitat

Found throughout the plains of peninsular India and in the dry hills of the lower Himalayas up to an altitude of 1500 m. Frequently cultivated on sandy soils near the coasts of peninsular India for its bulbs, which are used in traditional medicine.

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Medicinal properties and uses

The dried, powdered bulbs are yellowish-white to pale brown in colour, hygroscopic, bitter, acrid and mucilaginous. In Ayurveda they are considered heating, anthelmintic and alexiteric; in Unani medicine they are used to treat paralysis, bronchitis, asthma, dropsy, rheumatism, renal calculi, leprosy, scabies and other skin diseases, headaches and diseases of the nose. Taken in small doses they possess cardiotonic, stimulant, expectorant and diuretic properties; in large doses they are emetic and cathartic and may cause cardiac depression. They are mainly used, in the form of a tincture or syrup, as a powerful expectorant in the treatment of coughs, usually in chronic bronchitis and asthma. The bulbs are also used as a deobstruent, and prescribed for dropsy, rheumatism and skin diseases; their paste is used externally to remove corns and warts. Among the Rabaris in the Barda Hills of Gujarat, the powdered corms are used to treat asthma and tuberculosis. The warmed, bruised bulbs are also applied to the feet to relieve burning sensations. A paste of the leaves is applied locally to relieve chapped and cracked skin by the Sahariyas of Rajasthan. An alcoholic extract of the bulbs reportedly shows hypoglycaemic activity, and anti-cancer activity against human epidermoid carcinoma of the nasopharynx and against Friend-Virus leukaemia in mice.

References

Bhatt *et al.* (1999), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Jadeja (1999), Joshi (1989), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

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Linaceae

Linum usitatissimum L.

Common names

Bengali: masina, tisi; ***English:*** flax, linseed; ***Gujarati:*** alshi, alsi; ***Hindi:*** alsi, tisi; ***Kannada:*** agasi, alashi, alasi, seeme agase beeja; ***Konkani:*** sonnbiam; ***Malayalam:*** cheruchanavittintevilta; ***Marathi:*** alashi, javas; ***Oriya:*** pesu; ***Punjabi:*** alish, alsi, tisi; ***Sanskrit:*** atasi, uma; ***Tamil:*** alivirai, alshi; ***Telegu:*** atasi, avisi, madanginjalu, ullusulu; ***Urdu:*** alasi.

Description

An erect annual 0.6–1.2 m high; stems solitary or few, corymbosely branched, branches ascending towards the apex. Leaves to 3.8 cm long, linear-lanceolate, attenuated at both ends, acute at apex. Flowers *c.* 2.5 cm across, blue, bluish-violet, or white, borne in terminal corymbose panicles; sepals 5, the outer 2 elliptic, acuminate with entire, membranous margins, the inner 3 broader, acuminate, with ciliate margins; petals slightly crenate. Fruits (capsules) mucronate, 5-celled, each containing 2 seeds. Seeds small, ovoid, compressed, yellowish or blackish-brown with smooth, shining coat.

Distribution and habitat

Believed to have originated in the Mediterranean or between the Persian Gulf and the Caspian and Black Seas. Cultivated since antiquity from the western Mediterranean to central and southern Asia for fibre (*flax*) and seed oil. Found in cultivation throughout the plains of India and up to an altitude of 1800 m in northern India.

Medicinal properties and uses

The expressed oil from the seeds (*linseed oil*) is a common base for embrocations and

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liniments and is recommended for external use only. A mixture of equal volumes of linseed oil and calcium hydroxide (*Lotio calcii hydroxidi oleosa*) is a popular application for burns. In Unani medicine the seed oil is used to treat ringworm, and the flowers are considered tonic to the brain and the heart. The dried, ripe seeds are used as a demulcent and, in the form of poultices, for relieving swellings due to gout or rheumatism; they are also used to treat gonorrhoea and genito-urinary irritations. The flowers are sometimes used as a nervine and cardiac tonic.

References

Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

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Loganiaceae

Strychnos nux-vomica L.

Common names

Bengali: kuchila, thalkesur; ***English***: nux-vomica tree, snake-wood, strychnine tree; ***Gujarati***: kuchla; ***Hindi***: bailewa, chibbige, kaira, kajra, kuchila, kuchla; ***Kannada***: hemmushti, ittangi, itti, kanjira, nanjina koradu; ***Konkani***: kazro; ***Malayalam***: kanjeram, kanjiram, kanniram, kariram; ***Marathi***: jharkat-achura, kajra, kar, kara; ***Oriya***: kachila, kochila, korra, kosila, kuchial; ***Punjabi***: kagophale, kuchila, rajra, ruchila; ***Sanskrit***: garadruma, karaskarah, kulaka, kupila, kupiluh, vishamushti; ***Tamil***: eddi, etti, kagodi, kanchurai, kanjaram, kanjirai, yetti; ***Telegu***: bibtemupticheu, mushidi, mushti; ***Urdu***: azaraki, kuchala.

Description

An evergreen or deciduous tree generally 8–13 m tall (to 30 m under optimal conditions) with a straight stem and smooth, yellow-grey bark; stems compressed-cylindrical; branching pattern dichotomous, branches swollen at nodes. Leaves glabrous or shining, 3.5–12 cm long and 1.8–7 cm wide, broadly ovate or elliptic, apex obtuse, rounded, or shortly acuminate, base obtuse or acute, margins entire, 3- to 5-nerved from the base with prominent central nerves; petioles 0.5–1 cm long. Flowers greenish-white, on slender pedicels in short-pedunculate, minutely pubescent, terminal or axillary cymes; calyx 2.5 mm long, pubescent outside, segments 5, lanceolate, acute, to 1.5 mm long; corolla less than 1.3 cm long, 4–5-lobed, tube cylindrical. Fruits (berries) globose, 2.5–7.5 cm in diameter, yellow-orange, orange to red when ripe, containing 1–6 disc-shaped, ash-grey or greenish-grey, seeds 1.2–2.5 cm in diameter and 0.2 cm thick, covered with fine, silky hairs embedded in white, bitter pulp. Flowers from March to April; fruits ripen during the winter months.

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Distribution and habitat

Native to India, Sri Lanka, Thailand and Indochina. Found throughout tropical India in semi-evergreen, moist and dry deciduous forests to an altitude of 1350 m from Uttar Pradesh to West Bengal southwards to Karnataka, Kerala and Tamilnadu. Most common in the monsoonal forests along the western coast of peninsular India. Sometimes cultivated in gardens.

Medicinal properties and uses

The drug *Nux-vomica* consists of the ripe or dried seeds. In traditional Indian medicine they are considered tonic, antidiarrhoeal, antidysenteric, antispasmodic, emetic, febrifuge and stimulant, and are an ingredient of preparations prescribed for a variety of nervous disorders. In Ayurveda they are reportedly used to treat intermittent fever, dyspepsia, chronic dysentery, paralysis, itching, piles, worms, anaemia, jaundice and urinary discharges, chronic rheumatism, insomnia and colic. In Unani medicine, they are used externally for joint pains, lumbago, ringworm, piles and paralysis. The leaves are reportedly used as a poultice to promote healing of wounds and maggot-infested ulcers. The bark juice is used in the treatment of cholera and acute dysentery, and a decoction of the bark is used to treat epilepsy. In southern Orissa, the stem bark ground with lemon juice is made into pills that are taken orally in cases of acute diarrhoea. The juice expressed from the fresh wood is reportedly used for treating dysentery, fevers and dyspepsia. The bitter root and root bark are used as a febrifuge; the root bark, ground into a fine paste with lime juice and made into a pill, is considered useful for treating cholera.

Warning

All parts of the plant contain highly toxic alkaloids, the most important being strychnine and brucine. These are most concentrated in the seeds, which act as a powerful poison in large doses, producing tetanic convulsions and eventual death.

References

Chatterjee and Pakrashi (1995), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935), Mohanty *et al.* (1996), Sivarajan and Balachandran (1994), Yoganarasimhan (1996).

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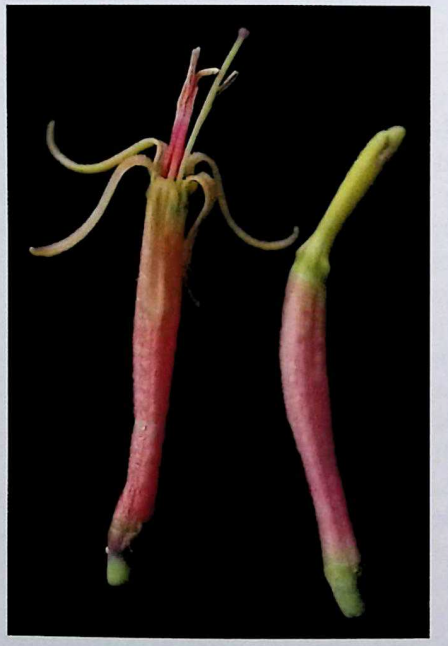
Loranthaceae

Dendrophthoe falcata (L. f.) Ettingsh.

Botanical synonyms

Loranthus amplexifolius Desr., *L. bicolor* Roxb., *L. falcatus* L. f., *L. longiflorus* Desr.



Common names

Bengali: baramanda; ***Gujarati***: vando; ***Hindi***: banda; ***Kannada***: badanike, bandhulu, kesarakabandanike, muddupa; ***Malayalam***: ithil, itti, ittukanni, kannirattinmelpulluni, pulunni, utia; ***Marathi***: vanda; ***Oriya***: bridhongo, jhajangi; ***Punjabi***: amut, banda, panda; ***Sanskrit***: vanda, vrksadani; ***Tamil***: kamaricham, plavithil, pulluri, pulluruvi, sangattanmarattubulluruvi, uchi, uruvi; ***Telegu***: bandanika, jiddu, velagabadanika, yelinga.

Description

A large, bushy, evergreen, parasitic plant with smooth grey bark; young parts glabrous or nearly so. Leaves subopposite, coriaceous, highly variable in size and shape, most often ovate-oblong, 7.5–20 cm long and 2–10 cm wide, apex and base usually obtuse, margins often minutely white; petioles 0–13 mm long. Flowers borne in short, spreading axillary racemes; pedicels short; bract 1.6 mm long, broadly ovate, concave; calyx 4 mm long, more or less tomentose, tube cylindrical, limb cupular, truncate or shortly 5-toothed; corolla 2.5–5 cm long, split at the back, tube curved, orange-red to scarlet or less commonly pink or white, lobes 5, linear, 1 cm long, reflexed, green or yellowish, filaments bright red, anthers yellow. Fruit a fleshy, ovoid or oblong berry 0.8–1.7 cm long and *c.* 0.6 cm wide, bright pink when mature. In central India flowers between November and March and fruits from February to April.

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Distribution and habitat

Widely distributed throughout tropical Asia from India to northern Australia. Common in deciduous forests of India and Sri Lanka; in central India its common hosts include *Madhuca indica* (*Sapotaceae*), *Buchanania lanzan* (*Anacardiaceae*), *Boswellia serrata* (*Burseraceae*) and *Acacia leucophloea* (*Fabaceae-Mimosoideae*).

Medicinal properties and uses

The bark is considered astringent and narcotic, and is used to treat wounds and menstrual problems and as a remedy for consumption, asthma and mania. Among the tribal inhabitants of central Orissa, the extract from the crushed leaves is taken orally to treat leucorrhoea. The lukewarm leaf juice is used as an eardrop to cure earache among the Gonds of Uttar Pradesh; an aqueous extract of the plant is used to control vomiting due to tuberculosis.

References

Asolkar *et al.* (1992), Chatterjee and Pakrashi (1991), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Sahoo and Mudgal (1995), Singh and Prakash (1994).

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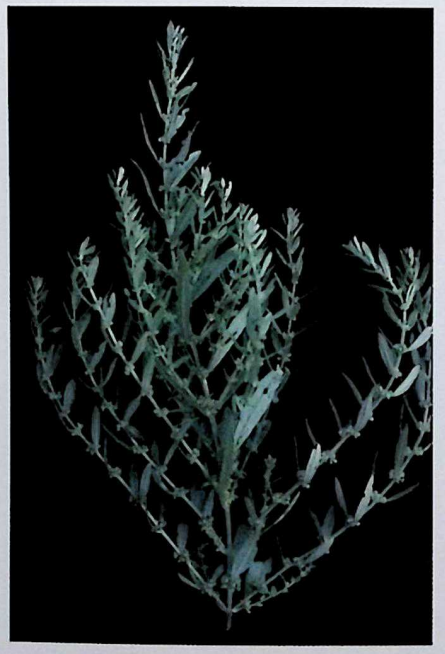
Lythraceae

Ammannia baccifera L.

Botanical synonyms

Ammannia aegyptiaca Willd., *A. baccifera* subsp. *aegyptiaca* (Willd.) Koehne, *A. indica* Lam., *A. salicifolia* Hiern., *A. vesicatoria* Roxb.



Common names

Bengali: banmarach, ***English***: blistering ammania; ***Gujarati***: jalaagiy, jalavgiyo; ***Hindi***: dadmari, janglimehandi, kuranda; ***Kannada***: kallurive; ***Malayalam***: kalluravanchi; ***Marathi***: bharajambula, bhar-jambhul; ***Punjabi***: dederbuti; ***Sanskrit***: agnigarva, kurandika, pasanabheda, sukaranda, vikata; ***Tamil***: kallurivi, kalluruvipoondu, nirumelneruppu; ***Telegu***: agnivednapaku; ***Urdu***: agya.

Description

A glabrous, erect, branching annual herb up to 80 cm tall; stems 4-angled or winged. Leaves opposite or alternate, 7–70 mm long and 1–15 mm wide, linear-lanceolate to oblong, obtuse to subacute at apex, cuneate to cordate at base. Flowers pink, borne in dense clusters or short axillary cymes; calyx 1–2 mm long, tube hemispheric, teeth 4, broad, triangular; petals absent or minute. Fruit (capsule) globose, 1–2 mm in diameter, partly covered by the calyx tube, reddish; seeds small, reddish with faint striations when mature.

Distribution and habitat

Widely distributed throughout the Old World tropics and subtropics from eastern and southern Africa to Japan, the Philippines, Indonesia and Australia; introduced and naturalized in the West Indies.

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Common thoughout India in moist habitats, often as a weed in rice fields.

Medicinal properties and uses

In Ayurveda, the leaves are considered laxative, stomachic, aphrodisiac and useful for treating strangury; in Unani they are used as an appetizer. They are also reportedly used in the treatment of rheumatic pains and fevers. In Siddha, the whole plants or leaves are used in the treatment of glandular swellings, leucorrhoea, snake-bite poisoning, abscesses, intermittent fever, ulcers and polyuria. A decoction of the leaves is taken internally to relieve coughs and colds by the Bhils of Rajasthan. The fresh, bruised leaves are used as a rubifacient and external remedy for ringworm and other skin diseases. The boiled leaves are applied to the abdomen to relieve postnatal pains by Bhil women in Rajasthan. The leaves or the ashes of the plant are mixed with oil and applied to cure herpetic eruptions. The roots are used in Ayurveda as a substitute for those of *Aerva lanata* (*Amaranthaceae*). The herb is reported to possess anti-typhoid and anti-tubercular properties.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956), CSIR (1948–1992), Joshi (1989), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

Lagerstroemia speciosa (L.) Pers.

Botanical synonym

Lagerstroemia flos-reginae Retz.

Common names

Bengali: ajar, jarul; ***English***: queen crepe myrtle, queen of flowers; ***Gujarati***: bondaro, jarul, moto-bhandaro; ***Hindi***: arjuna, jarul; ***Kannada***: challa, holedasal, holedasavala, holematti, nirbendeka; ***Konkani***: tamonn; ***Malayalam***: adamboe, chemmaruta, cholaventekku, manimaruthu, nirmarutha; ***Marathi***: bendara, mota-bondara, taman; ***Oriya***: ary, jarulo, patoli, patuli; ***Punjabi***: jarul; ***Sanskrit***: arjuna, jarula, kramuka; ***Tamil***: kadali, kodali, pumaruthu; ***Telegu***: varagogu.

Description

A medium-sized to large deciduous tree up to 20 m tall with a wide-spreading, rounded crown; bark pale-greyish, with vertical lines, flaking off in irregular scales. Leaves opposite or subopposite, elliptic, oblong, ovate or oblong-lanceolate, 8–30 cm long and 3–10 cm wide, apex acute, acuminate or obtuse, base rounded or somewhat narrowed; petioles reddish, 0.5–1.2 cm long; venation 13–16 pairs. Flowers mauve to purple, 5–10 cm across, borne in large panicles 10–40 cm long and 5–20 cm wide; pedicels stout, pubescent; calyx turbinate, 1.6 cm long, covered with white or rusty tomentum, ribbed with 12–14 prominent stout ridges, teeth 6–7,

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triangular, 6 mm long; petals 6–7, 2.5–3.8 cm long, suborbicular or ovate, clawed, undulate and crumpled. Fruit (capsule) ellipsoid or rounded, 6-valved, 1.5–3.3 cm long and 1.2–2.3 cm wide; seeds glabrous, pale brown, winged, 1.2–1.5 cm long. Flowers from April to May in Karnataka.

Distribution and habitat

Native range extends from India and Sri Lanka eastwards through Myanmar (Burma), Indochina and Malesia to the Philippines and New Guinea; cultivated throughout the tropics. Found throughout India, most commonly along banks of rivers and streams and other moist habitats in West Bengal, Assam and peninsular India to 900 m elevation. Widely planted as an ornamental tree in gardens and along roads.

Medicinal properties and uses

The leaves are considered purgative, deobstruent and diuretic. A decoction of the leaves, or of the dried fruits, prepared like tea, is used to treat diabetes mellitus in the Philippines. The bark is considered purgative, stimulant and febrifuge; its decoction or infusion is used to relieve abdominal pain and diarrhoea. The roots are considered astringent, stimulant and febrifuge. The fruit is reportedly used as a local application to treat aphthae (ulcers) of the mouth. The seeds are narcotic. In Ayurveda, the bark is used as a purgative and in the treatment of diabetes.

References

Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

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Lawsonia inermis L.

Botanical synonyms

Lawsonia alba Lam., *L. spinosa* L.

Common names

Bengali: mehedi, mendi, shudi; ***English***: Egyptian privet, henna; ***Gujarati***: medi, mendi; ***Hindi***: hena, mehndi; ***Kannada***: gorante, goranti, gorantu, korate, madranga, mayilanchi; ***Konkani***: meti; ***Malayalam***: mailanchi, mayilanji, pontalasi; ***Marathi***: mendhi, mendi; ***Oriya***: benjati, manghati, manjuati, mehendi, mendi, monjuati, olata, rongota; ***Punjab***: hinna, mehndi, nakrize, panwar; ***Sanskrit***: kuravaka, madayantika, mendhi, mendika, nakharanjani; ***Tamil***: marithondi, marudondri, maruthani; ***Telegu***: goranti, gorinta; ***Urdu***: mehendi.

Description

A much-branched shrub or small tree up to 7 m tall with greyish-brown bark; branches quadrangular, spines (modified branchlets) sometimes present, up to 3.5 cm long. Leaves opposite, sessile, elliptic-ovate or broadly lanceolate, 1–8.5 cm long and 0.2–3.8 cm wide, apex acute, apiculate or occasionally rounded, base cuneate, margins entire. Flowers numerous, small, white or rose-coloured, fragrant, in terminal, pyramidal, panicled cymes 3–25 cm long; pedicels short, slender; calyx 3–5 mm long, broadly campanulate, lobes 2.5–3 mm long, ovate, acute; petals 3 mm long and wide, suborbicular, undulate. Fruit (capsule) globose, purplish-green to brownish when ripe, 6–7 mm in diameter, containing numerous, pyramidal, smooth seeds *c.* 2.5 mm long. Flowers and fruits at different times depending on locality; mainly between July and December in central India, and from March to September in southern India.

Distribution and habitat

Its centre of origin unknown, it is now found in the dry zones of tropical Africa, the Middle East, South and Southeast Asia to New Guinea and Australia; extensively planted as a hedge plant, and often naturalized, throughout its range. Cultivated in large-scale plantations as a commercial dye crop in India, Egypt, Sudan, Iran, Madagascar, Pakistan and Australia.

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Medicinal properties and uses

The dried ground leaves have been used for centuries from North Africa to Southeast Asia for dyeing hair and colouring hands, feet and fingernails. *Henna* leaves have astringent properties and are sometimes used as a prophylactic against skin diseases. They are used externally in the form of a paste or decoction to treat boils, burns, bruises and skin inflammations, and to relieve headache and burning feet. In Unani medicine they are considered vulnerary and diuretic and useful for treating hemicrania, lumbago, bronchitis, ulcers, stomatitis, ophthalmia, syphilitic sores, amenorrhoea, scabies and diseases of the spleen; in Ayurveda the leaves are used to treat leucoderma. In southern India an extract from the flowering twigs and leaves is used to treat leprosy. The Bhils of Rajasthan reportedly use the leaf paste to treat conjunctivitis. A decoction of the leaves is used as a gargle for sore throat. The leaf juice mixed with water is used as a remedy for spermatorrhoea. The flowers possess cooling and soporific properties. The seeds are considered astringent to the bowels and antipyretic in Ayurveda, and a brain tonic in Unani medicine. The powdered seeds are used as an antifertility agent among tribal women in Udaipur District, Rajasthan. The bark is used to treat enlargement of the spleen, in calculous affections, and as an alterative in the treatment of skin diseases and leprosy. In southern Orissa, a preparation consisting of the pounded roots, neem leaves (*Azadirachta indica*: *Meliaceae*), coconut root and dried ginger, is given to infants to check diarrhoea.

References

Chopra *et al.* (1956, 1969), CSIR (1948–1992), Joshi (1989), Katewa and Arora (1997), Kirtikar *et al.* (1935), Mohanty *et al.* (1996), Yoganarasimhan (1996).

Punica granatum L.

Common names

Bengali: dalim, dalimgachh; ***English***: pomegranate tree; ***Gujarati***: dadam, dudlom; ***Hindi***: anar, anarkeper, dal, daru, dhalimb, dharimb, dharu; ***Kannada***: dadima, dalimbe, hulidalimbe, husidalimbe; ***Konkani***: dalimb, dallimbini; ***Malayalam***: dadiman, matalam, matalanarakam, pumatalam, raktabijam, talimatalam, urumampalam, uruyampalam; ***Marathi***: dalimba; ***Oriya***: dalimbo, dalimo; ***Punjabi***: anar, daruna, dharu; ***Sanskrit***: dadima, dadimah, darimba; ***Tamil***: madalai, madulai; ***Telegu***: dalimba, dalimma, danimma; ***Urdu***: anarmitha.

Description

A shrub or small tree up to 10 m tall, with smooth, thin, dark grey bark, often armed with small axillary or terminal thorns. Leaves opposite, oblong-lanceolate, oblong-elliptic or oblong-oblanceolate, 2–8 cm long, margins entire, base narrowed into a very short petiole, shining above, bright green beneath. Flowers usually scarlet red, sometimes yellow, 3.7–5 cm long and

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wide, solitary or 2–4 together; calyx tube campanulate, coriaceous, lobes 5–7; petals 5–7, obovate, wrinkled, inserted between the calyx lobes. Fruit globose, 3.8–10 cm in diameter, crowned by a persistent calyx, with a leathery woody rind, septate with membranous walls, containing numerous angular seeds, each surrounded by a whitish to red, edible testa. There are numerous cultivated varieties that differ in their fruit characteristics.

Distribution and habitat

Believed to be native from the Balkans to the Himalayas. In India it grows wild in the warm valleys and outer hills of the western Himalayas from 900 to 1800 m elevation; cultivated throughout the country for its delicious fruits.

Medicinal properties and uses

The fresh fruit juice is used as an ingredient of cooling mixtures, and in some medicines used to treat dyspepsia. The rind is valued as an astringent and used in combination with aromatics such as cloves for treating diarrhoea and dysentery, as well as for dyspepsia, colitis, piles and uterine disorders. The expressed juice of the leaves and young fruits, and a decoction of the bark are also used to treat dysentery. In southern Orissa a paste prepared from the unripe fruit or leaf buds, mixed with water in which rice has been washed and a pinch of opium, is administered to check diarrhoea. The powdered flower buds are reportedly used to treat bronchitis. In northeastern Karnataka the juice of the flowers, mixed with that of *Cynodon dactylon* (*Poaceae*) leaves, is applied in the nose to control nosebleeds. The seeds are considered to be stomachic. The bark and seeds are reportedly used to treat bronchitis (in Ayurveda); in Unani medicine the astringent bark is used to strengthen the gums and to treat piles, anal prolapse and colic. Extracts of the dried bark of both the stem and root are used internally in the form of a decoction to treat patients with tapeworms. In Ayurveda the roots are used as an external application as a vermicide. The fruit rind is used as a tanning and dyeing material throughout the species' native and introduced range.

References

Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935), Mohanty *et al.* (1996), Seetharam *et al.* (1999), Sivarajan and Balachandran (1994), Yoganarasimhan (1996).

Woodfordia fruticosa (L.) Kurz

Botanical synonyms

Grislea punctata Sm., *G. tomentosa* Roxb., *Lythrum fruticosum* L., *Woodfordia floribunda* Salisb., *W. tomentosa* (Roxb.) Bedd.

Common names

Bengali: dawai, dhai; ***English***: fire-flame bush; ***Gujarati***: dhavdi, dhawadi; ***Hindi***: dawi, dhai, dhanwai, dhaula, dhaura, santha, shataki, thawi; ***Kannada***: bela, tamrapushpi; ***Malayalam***: tatire, tatiri; ***Marathi***: dayati, dhaiphal, phulsatti; ***Oriya***: dhadki, harwari, jatiko; ***Punjabi***: dahai, dhataki, dhaur, dhawi, gul bahar (flowers), guldhawi, tawi, thai; ***Sanskrit***: agnivala, dhataki; ***Tamil***: velakkai; ***Telegu***: dhataki, gaddaisinka, jagi, jaji, jargi, serinji.

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Description

A much-branched woody shrub up to 3.6 m tall with fluted stems and long, spreading branches; bark smooth, reddish-brown, peeling off in thin, fibrous strips; young branches often clothed with fine white pubescence. Leaves simple, opposite, sub-opposite or in whorls of 3, short-petioled or sessile, 5–10 cm long and 1.3–2.5 cm wide, lanceolate to oblong-lanceolate, narrowly acute at apex, cordate at base, with 6–12 pairs of nerves looped at margins, softly velvety above, grey-pubescent and gland-dotted beneath. Flowers numerous, borne in dense, 2–16-flowered, axillary clusters; calyx tube 9–15 mm long and 2–5 mm wide, lobes oblong-ovate, petals brilliant orange-red or scarlet, lanceolate, acuminate, 3–5 mm long and 0.5–0.8 mm wide. Fruit an oblong, dehiscent capsule 6–10 mm long and 2.5–4.5 mm wide, containing numerous, minute, smooth obovate seeds. In central India, flowering occurs between January and April, and fruiting from April to May.

Distribution and habitat

Widely distributed in the Old World tropics and subtropics from East Africa, Madagascar and Arabia to Indonesia, China and Japan. Found throughout most of northern and central India as far south as Karnataka and Andhra Pradesh, to an elevation of 1500 m in the Himalayas. In central India it typically occurs on dry, exposed, rocky sites in scrub and deciduous forests; uncommon in South India. Cultivated in gardens for its attractive flowers in many parts of India.

Medicinal properties and uses

The dried flowers, considered stimulant and astringent, are used in Ayurveda to treat thirst, toothache, bleeding, wounds, anorexia, diarrhoea, dysentery, leucorrhoea, amenorrhoea and herpes. They are an ingredient of several compound Ayurvedic preparations. The dried fruits, flowers, buds and inflorescence form a commercial drug used to treat bowel complaints, haemorrhages, menorrhagia and seminal weakness; the drug is also useful for reducing fever. Among the tribal inhabitants of Madhya Pradesh, a decoction of the leaves and twigs is taken internally to treat boils and body swellings. In Ayurveda the pungent, acrid bark is considered alexiteric, anthelmintic and a uterine sedative; it is used to treat dysentery, leprosy, erysipelas and diseases of the blood. The powdered roots are taken orally to relieve coughs among the Paudi Bhuinya in northern Orissa. The flowers also yield a red dye used throughout India for dyeing fabrics.

References

Aminuddin and Girach (1996), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Shah and Singh (1990), Sivarajan and Balachandran (1994), Yoganarasimhan (1996).

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Magnoliaceae

Michelia champaca L.

Botanical synonyms

Michelia pilifera Bakh. F., *M. velutina* auct. non DC.

Common names

Bengali: champa, champaka, chumpa; ***English***: golden champa, yellow champa; ***Gujarati***: champo, pitochampo, raechampo, sonchampo; ***Hindi***: champa, champaka; ***Kannada***: kendasampige, kolasampige, sampige; ***Konkani***: champa, champo, pudchampo; ***Malayalam***: champakam; ***Marathi***: kudchampa, pivalachampa, sonachampa; ***Oriya***: chompa, chompoko, manchana; ***Punjabi***: chamba, chamoti, champa, chamuti; ***Sanskrit***: campaca, campaka, champaka; ***Tamil***: amariyam, champugam, sembagam, shampangi, shembuga, vandumarmalar; ***Telegu***: champakamu, champeyamu, gangaravi, hemangamu, kanjanamu, sampangi.

Description

A medium-sized to large evergreen tree up to 30 m tall with a straight, cylindrical trunk, dark-grey bark, and dense spreading crown. Leaves 10–30 cm long and 4–10 cm wide, lanceolate or ovate, apex acute or acuminate, margins entire; main lateral nerves 7–14 pairs; petiole 2–4 cm long with a short, stipular scar from its base to its middle. Flowers showy and very fragrant, light yellow turning orange-yellow, solitary, axillary, 2.5–6.2 cm in diameter; buds enclosed in a greyish-yellow, pubescent, spathe-like bract; sepals and petals 15–21, the outer oblong, acute, the inner linear; pedicels 6 mm long, stout, wrinkled. Fruit (capsules) *c.* 2 cm long, dark brown, opening by two valves; valves woody, orbicular, covered with white, warty excrescences. Seeds 1–12, brown, polished, variously angled, turning pink or scarlet on maturity. Flowers from April to

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September; fruits ripen during the winter months (December–February).

Distribution and habitat

Widely distributed through tropical Asia from India and Myanmar (Burma) to Indochina, Thailand, peninsular Malaysia, Sumatra, Java and the Lesser Sunda Islands; commonly cultivated as a garden ornamental throughout the tropics. Possibly native only to India, it occurs naturally in the eastern Himalayas, northeastern India, in the Western Ghats and elsewhere in southern India up to 900 m elevation. Cultivated in many parts of India for its attractive foliage and fragrant flowers. The tree requires deep, moist soils and thrives best in a damp climate.

Medicinal properties and uses

The astringent bark is used as a febrifuge, diuretic, diaphoretic, stimulant, vermifuge and expectorant in traditional Indian medicine. An infusion of the dried root and root bark is considered purgative and emmenagogue. Mixed with curdled milk, the dried root and root bark are reportedly used as an external application to promote healing of abscesses. The juice of the leaves is given with honey for colic. Flowers and fruits are considered stimulant, antispasmodic, tonic, stomachic, carminative, bitter and cooling. They are used to treat dyspepsia, nausea and fever, and as a diuretic in the treatment of renal diseases and gonorrhoea. The seed oil, flower oil or decoction of the flowers is used as an external application for headache, ophthalmia, gout and rheumatism. The seeds and fruits are applied to the feet for healing cracked skin.

References

Chatterjee and Pakrashi (1991), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935), Sivarajan and Balachandran (1994).

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Malpighiaceae

Hiptage benghalensis (L.) Kurz

Botanical synonyms

Banisteria benghalensis L., *Gaertnera racemosa* (Cav.) Roxb., *Hiptage madablota* Gaertn., *H. obtusifolia* (Roxb.) DC., *H. parviflora* Wight & Arn.

Common names

Bengali: bosanti, madhavilata, madhubhi, madhubhlata; ***Gujarati***: madhavi, ragatpiti, rakatpiti; ***Hindi***: aneta, hutimukta, kampti, madhavilata, madhmalti, madholata; ***Kannada***: madhavi, madhavi lathe, vasantaduti; ***Malayalam***: sitampu; ***Marathi***: haladvel, haladwail, madhavi; ***Oriya***: boromali, gorunda, losori, madhobilota, maloti; ***Punjabi***: benkar, chabuk, chopar, endra; ***Sanskrit***: madhavi; ***Tamil***: adigam, madavi, vasandagalamalligai, vasandi; ***Telegu***: atimutamu, madhavi-tige, vadlayerala.

Description

A large, evergreen, climbing shrub with brownish bark peeling off in flakes; young parts silky. Leaves opposite, coriaceous, 9–18 cm long and 4–8 cm wide, lanceolate to elliptic-oblong, apex acute to acuminate, base rounded to cuneate, margins entire; lower surface finely hairy; venation reticulate; petioles thick, 0.6–1 cm long, silky-pubescent. Flowers 1.2–2 cm across, fragrant, white with a yellow or pink tinge, borne in erect, finely tomentose terminal and axillary racemes about as long as the leaves; bracts lanceolate; calyx persistent, densely pubescent outside; lobes oblong, obtuse, 1 with a large oblong gland at the base outside, *c.* 5 mm long; petals *c.* 1 cm long, orbicular, clawed, fringed on the margin, the uppermost petal broader than the others. Fruit a 3-winged samara, wings 2–3.8 cm long; seeds solitary, globose. In central India, flowering occurs mainly between February and April,

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sometimes also in October; fruiting occurs mainly from April to June.

Distribution and habitat

Widespread throughout India (except in the driest regions), Sri Lanka and the Andaman Islands, Bangladesh, and Myanmar (Burma) to southern China, Taiwan and the Philippines and Sumatra. In India it is found chiefly in moist habitats such as along riverbanks and in ravines, to an altitude of approximately 1800 m; widely cultivated in gardens for its attractive flowers.

Medicinal properties and uses

In Ayurveda the leaves and bark are considered vulnerary; the leaves are highly regarded for treating skin diseases. The leaf juice possesses insecticidal properties and is used an external application for scabies. The plant is also used in the treatment of chronic rheumatism and asthma.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Upadhye *et al.* (1994), Yoganarasimhan (1996).

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Malvaceae

Abelmoschus esculentus (L.) Moench

Botanical synonym

Hibiscus esculentus L.

Common names

Bengali: dhenras, dheras, ramtorai; ***English***: gumbo, lady's finger, okra; ***Gujarati***: bhinda, bhindu; ***Hindi***: bhindi, katavandai, ramturai; ***Kannada***: bendakainaru, bende; ***Konkani***: bendo; ***Malayalam***: vanta, venda; ***Marathi***: bhenda, bhendi; ***Oriya***: bhendi; ***Punjabi***: bhindatori, bhindi, ramturai; ***Sanskrit***: bhenda, darivka, gandhamula, tindisa; ***Tamil***: vendai, vendi; ***Telegu***: benda, bendi, penda, venda; ***Urdu***: bhendi.

Description

An erect, simple or branched, annual herb with an aromatic clove-like odour, 0.5–2 m tall, covered with hairs. Leaves transversely elliptic in outline, base cordate, 5–25 cm long and 5–30 cm wide, palmately 3- to 5(-7)-lobed, with oblong-lanceolate or triangular, coarsely-toothed lobes; petioles 15 cm long, hairy; stipules subulate. Flowers axillary, 5–8 cm across, yellow with a crimson centre; pedicels *c.* 2.5 cm long; involucral bracts 8–10, deciduous, as long as the calyx; calyx not inflated, 5-lobed, 1.5–3 cm long. Fruits (capsules) elongated, conical, 7-angled, to 30 cm long, green or creamy-green, with longitudinal ridges, smooth or hairy; seeds many, rounded, striate, hairy. Flowers and fruits throughout the year, depending on season of sowing, but mainly from June through to December.

Distribution and habitat

Probably originating in Asia or possibly Africa, it is cultivated as a garden crop or mixed field crop throughout India to an altitude of 1200 m and elsewhere in the

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tropics and subtropics. Occasionally naturalized in fields, on degraded lands, along roadsides, and in early secondary vegetation.

Medicinal properties and uses

The tender, nutritious pods (fruits) are eaten as a vegetable. In Ayurveda they are considered tonic, astringent and aphrodisiac, but may cause dyspepsia and are not recommended for patients suffering from bronchitis. In Unani medicine the fruits are considered emollient and useful for treating urinary discharges and gonorrhoea, strangury and diarrhoea. The immature pods are emollient, demulcent and diuretic, and are used in the form of a decoction in catarrhal affections, dysuria, dysentery and gonorrhoea. A preparation using the mucilage from the fruits and seeds is reportedly used as a plasma replacement. The leaves are used externally as an emollient poultice. The seeds are stimulant, cordial and antispasmodic. An infusion of the roasted seeds is credited with sudorific properties.

Warning

The fruits and leaves may cause skin irritation.

References

Asolkar *et al.* (1992), Chatterjee and Pakrashi (1992), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935).

Abelmoschus manihot (L.) Medic.

Botanical synonym

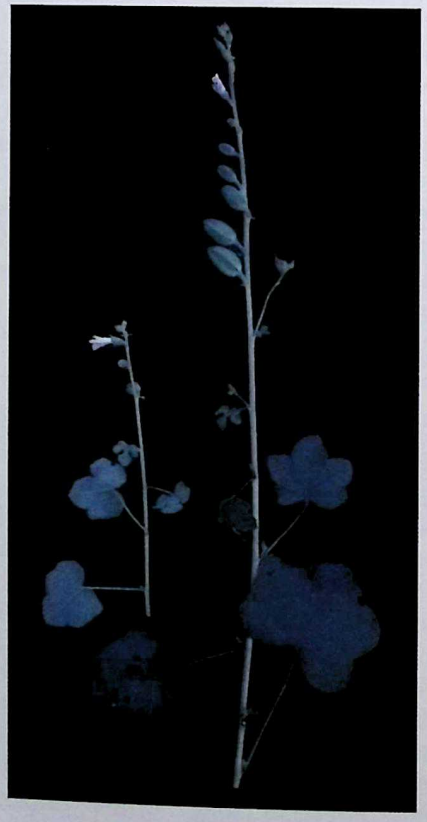
Hibiscus manihot L.

Common names

Gujarati: kantali, kantalo bhindo; ***Marathi***: jangli bhendi, ranbhendo.

Description

An erect, simple or branched, hairy perennial herb with a woody base, 0.5–2 m tall. Leaves palmately 3–7-lobed or -partite, cordate at base, 15–20 cm wide, hirsute; petioles usually 5–15 cm long; stipules linear-lanceolate, often 3-lobed, 1–2 cm long. Flowers axillary, solitary or in racemes, yellow with a purple centre, 5–10 cm across; pedicels less than 2.5 cm long; involucral bracts 4, 1.3–2 cm long, ovate-lanceolate; calyx softly villous, ovoid, acuminate in bud, 2.2 cm long, sepals connate to the tip, splitting down one side. Capsule oblong or ovoid, 4–6 cm long, 5-angled, pointed, bristly hairy; seeds subreniform, with hairy concentric rings, dark brown or black, approximately 4 mm long.



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Distribution and habitat

Native to China, introduced to India, where it is cultivated and often naturalized in West Bengal and in southwestern India from Gujarat to Kerala.

Medicinal properties and uses

The mashed leaves and roots are used in China, and by the Miris in Assam, as a poultice for boils, sprains and sores. The flowers are used in China to treat chronic bronchitis and toothache. The mucilage obtained from the bark is considered to be an emmenagogue. The mucilage extracted from the roots is widely used in sizing paper in China and Japan, and the stem yields a useful fibre similar to jute.

References

Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935).

Abelmoschus moschatus Medic.

Botanical synonyms

Abelmoschus rugosus Wight & Arn., *Hibiscus abelmoschus* L.

Common names

Bengali: kasturidana, mushkdana; ***English***: ambrette plant, musk mallow, muskseed; ***Gujarati***: mushakdana; ***Hindi***: kasturidana, mushkdana; ***Kannada***: kadu kasturi; ***Konkani***: bendo; ***Malayalam***: kasturiventa, kattukasthuri; ***Marathi***: kasturibhendi, mushk bhendi bij; ***Sanskrit***: latakasturika; ***Tamil***: kasturivendai, kattukasturi, vartti-laikasturi; ***Telegu***: karpurabenda, kasturibenda, nalabenda; ***Urdu***: mushkadanah.

Description

An erect, annual or biennial, hirsute herb 0.3–1.8 m tall with a stout taproot; stems usually clothed with long deflexed hairs. Leaves 6–22 cm long and 3–24 cm wide, cordate at base, mostly orbicular to transversely elliptic in outline, but variable in shape: lower ovate, acute; upper palmately 3–7-lobed, divided nearly to the base, lobes narrow-acute or oblong-ovate; margins crenate, serrate or irregularly toothed, hairy on both surfaces; petioles 2.5 cm long; stipules 12 mm long, subulate, hairy. Flowers

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usually solitary, axillary, sometimes in few-flowered racemes; involucral bracts 8–12, fulvous-hairy, *c.* 15 mm long, shorter than the calyx; calyx *c.* 3 cm long, hairy, ovoid, cuspidate in bud, sepals connate, 5-toothed at the apex, splitting down one side; corolla bright yellow with a purple centre, 5–7.5 cm across. Capsules 6.5–7.5 cm long, oblong-lanceolate, acute, fulvous-hairy; seeds many, subreniform, black, musk-scented. Flowers and fruits between June and January, depending on locality.

Distribution and habitat

Found in hilly regions throughout peninsular India as well as in the Himalayan foothills; cultivated in Maharashtra and Uttar Pradesh. It grows well on rich, well-drained soils, but poorly on clayey and sandy soils.

Medicinal properties and uses

The seeds are valued for their diuretic, demulcent and stomachic properties, and are considered stimulant, antiseptic, cooling, tonic, carminative and aphrodisiac. In Ayurveda the seeds are considered useful for treating intestinal problems, stomatitis and heart diseases; in Unani medicine they are also used to treat stomatitis, dyspepsia, urinary discharges, gonorrhoea, leucoderma and itching. A decoction, infusion or tincture of the seeds is used to treat nervous debility, hysteria and other nervous disorders. Rubbed to a paste with milk, the seeds are used externally to cure scabies, relieve itching, and for treating snake bite. The juice of the fresh plant is used as a febrifuge and expectorant. A poultice made from the crushed, whole plant is sometimes applied to the chest to treat bronchitis. The mucilage prepared from the leaves and roots is used to treat venereal diseases. An infusion of the flowers is reportedly used as a contraceptive. The plant is cultivated for its musk-scented seeds, which, in addition to their medicinal value, are used to flavour food, as a substitute for musk in perfumery and in powdered form as a moth repellent for woollens. The tender leaves and shoots are eaten in soups, and the green pods are sometimes eaten as a vegetable.

Warning

The fine hairs covering plants and fruits are irritating and can cause itching.

References

Asolkar *et al.* (1992), Chatterjee and Pakrashi (1992), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935).

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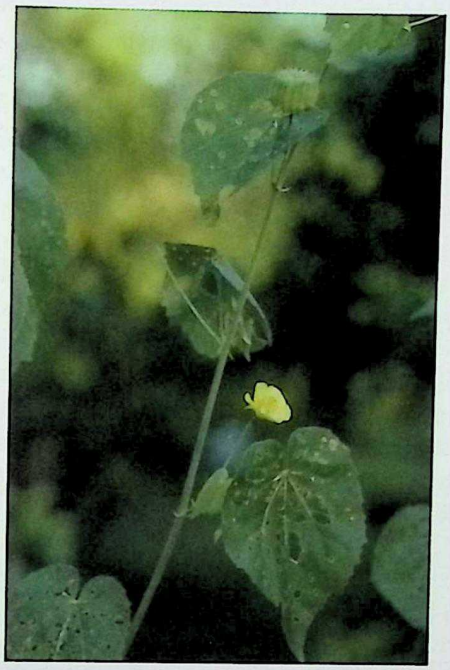
Abutilon indicum (L.) Sweet



Botanical synonyms

Abutilon asiaticum (L.) Sweet, *A. guineense* (Schum.) Baker f. & Exell, *Sida guineensis* Schum.

Common names

Bengali: jhampi, petari, potari; ***English***: country mallow; ***Gujarati***: dabali, kansaki, khapat; ***Hindi***: jhampi, khangani, kanghi; ***Kannada***: achyuta gida, gidutingi, hettukisu, kisangi, srimudre, srimudrigida; ***Konkani***: voddlipettari; ***Malayalam***: jhonkaped, uram; ***Marathi***: chakrabhenda, kangori, mudra; ***Oriya***: nakochono; ***Sanskrit***: atibala, kankatika; ***Tamil***: paniyarattutti, perumtutti, ponnaithutti, thuttli; ***Telegu***: adavibenda, botlabenda, peddabenda, tutturibendachettu; ***Urdu***: kanghi.

Description

A perennial herb or small shrub up to 3 m tall; stems round, often tinged with purple, densely pubescent. Leaves simple, alternate, 2.5–5 cm long and 2–5 cm wide, ovate to ovate-lanceolate or suborbicular, apex obtuse to acute, rarely acuminate, base obtuse to cordate, margins serrate-dentate, palmately 5–7-veined; petioles 3.8–7.5 cm long; stipules 9 mm long, linear, acute, deflexed. Flowers solitary, axillary, 2–3 cm in diameter, yellow or orange-yellow without purple centres; calyx campanulate, 5–11 mm long and 10–12 mm in diameter, lobes broadly ovate to triangular, pubescent; petals 1–1.8 cm long, overlapping. Schizocarp globular, 1.5–2 cm diameter; carpels 15–20, white-hairy, 2–4 times length of calyx, apically long-acute or acuminate; seeds 3–5, 1–1.5 mm long, reniform, grey to pale brown, glabrous, with minute raised scales. Flowers mainly between August and December and fruits from December and January in central India.

Distribution and habitat

Widely distributed throughout the tropics and subtropics. In India it is cultivated and also occurs naturally as a common weed of roadsides and degraded lands up to 1200 m elevation, more commonly in dry areas.

Medicinal properties and uses

The whole, dried plant is used as a drug in both the Ayurvedic and Unani systems, and is collected after the rainy season when in fruit. It is reported to be useful as a febrifuge, anthelmintic, anti-inflammatory, and to treat urinary and uterine discharges, piles and lumbago. The juice of the plant is applied as an emollient to relieve soreness of the buttocks in young children. The bark is astringent and diuretic. The leaves contain mucilage and are eaten cooked or in the form of a decoction to treat bleeding piles; their extract is reported to be used as a diuretic and demulcent, applied locally to boils and ulcers and as a fomentation to painful parts of the body. In northeastern Karnataka the leaves are taken with hot water to treat fever. Among the tribal inhabitants of Maharashtra, the raw leaves are eaten to check diabetes. A decoction of the leaves is used as mouthwash to soothe

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toothache and tender gums, externally as a wash for wounds and ulcers, as an enema and for vaginal infections, and given internally in the treatment of gonorrhoea and inflammation of the bladder. The root is considered tonic and diuretic, and is prescribed by Ayurvedic physicians to treat fever, cough, dysuria, diabetes, dysmenorrhoea, piles, diarrhoea and worms. Among the tribal inhabitants of southern Bihar, the powdered root is given to treat epilepsy. Mixed with honey, chaulmoogra oil (from the seeds of *Hydnocarpus kurzii*: *Flacourtiaceae*) and fresh paste of sandalwood (*Santalum album*: *Santalaceae*), the root is reported to be an efficacious treatment for leucoderma; addition of the oil from *Psoralea corylifolia* (*Fabaceae-Papilionoideae*) is said to improve the treatment. An infusion of the roots is considered useful for relieving fevers and is also given in strangury and haematuria. The seeds contain water-soluble mucilage and are used to prepare a cooling drink; they are used as a laxative for piles, a demulcent, to relieve coughs, and in the treatment of gonorrhoea, gleet and chronic cystitis.

References

Asolkar *et al.* (1992), Bhatt *et al.* (1999), Chatterjee and Pakrashi (1992), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Girach and Aminuddin (1995), Kirtikar *et al.* (1935), Seetharam *et al.* (1999), Sivarajan and Balachandran (1994), Upadhye *et al.* (1994).

Hibiscus cannabinus L.

Common names

Bengali: ambari, chandana, mestapat, nalita, patsan; ***English***: Bombay hemp, kenaf, mesta; ***Gujarati***: ambari, bhindiyamboi, sheria; ***Hindi***: ambari, patsan, pitwa; ***Kannada***: holadapundrike, pundi; ***Malayalam***: kanjaru; ***Marathi***: ambada, ambadi; ***Oriya***: bhanga, kanuriya, kornniya; ***Punjabi***: patsan, sankikra, sankokla, sinjubara; ***Sanskrit***: nali; ***Tamil***: pulichhai, pulimanji, kasini; ***Telegu***: gogu, gonkura, gaynaru.

Description

An erect, simple or branched annual herb 0.5–2 m tall with a straight, slender, glabrous or prickly stem. Leaves 5 cm across, glabrous; lower leaves cordate, upper deeply palmately 5–7-lobed; lobes oblong-lanceolate, sinuous, denticulate; petioles 3.8–5 cm long; stipules 9 mm long, subulate. Flowers solitary in the axils of upper leaves, 5–10 cm in diameter, yellow with a crimson centre; pedicels very short; involucral bracts 7–10, free, 9 mm long, linear, acute, often with prickly margins; calyx lobes 1.2–2.5 cm long, lanceolate, acuminate, densely white-tomentose with coarse bristles on margin, and with an obovate gland at the base of each lobe; corolla lobes 2.5–4 cm long. Capsules globose to ovoid, shortly acuminate, bristly, 1–2.5 cm long, containing large, brown, nearly glabrous bean-shaped seeds dotted with minute stellate scales. There are numerous cultivated and semi-wild varieties which differ from one another in the colour and thickness of the stem, leaf form and flower colour. Flowers between September and

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December; fruits mature between November and January.

Distribution and habitat

Aparently native to tropical Africa and introduced to India and elsewhere in tropical Asia, it is distributed throughout India up to 1000 m elevation. Cultivated as a fibre crop in the drier regions of Bihar, Madhya Pradesh, Maharashtra, Karnataka, Andhra Pradesh and Tamilnadu. It grows best in humid tropical regions on sites receiving 500–650 mm rainfall evenly distributed over a 4–5-month period followed by a dry period, on neutral, well-drained sandy loam soils.

Medicinal properties and uses

Juice made from the flowers, mixed with sugar and black pepper, is used as a popular remedy for constipation and gastritis. The seeds are reportedly aphrodisiac, and are used in external applications to relieve pain and bruises. The leaves are used as a purgative and, in Ayurveda, to treat diseases of the blood, bile and throat.

References

Asolkar *et al.* (1992), Chatterjee and Pakrashi (1992), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935).

Hibiscus sabdariffa L.

Common names

Bengali: chukar, lalmista, mesya, patwa; ***English***: red sorrel, roselle; ***Hindi***: lalambari, patwa; ***Kannada***: kempupundrike, pulachakiri, pundibija; ***Malayalam***: polechi, pulichchai; ***Marathi***: lal-ambadi, patwa; ***Sanskrit***: ambasthaki; ***Tamil***: gogu, kerai, pulichchai, simaikkasuru, sivappukkasuru; ***Telegu***: ettagongaka, ettagonguru, shimagonguru, teeagomgura, yerra gogu.

Description

An erect annual shrub up to 2 m tall, unbranched or with branches near the base; stem glabrous or slightly hairy with minute tubercles; stem and branches usually reddish-purple. Leaves 5–15 cm long and wide, suborbicular to elliptic in outline, base cuneate, margins serrate, lower leaves ovate and undivided, upper leaves palmately 3- to 5-lobed, glandular beneath; petioles 4–10 cm long, reddish-purple; stipules 10–12 mm long, narrowly triangular to linear, acute. Flowers 3–10 cm across, solitary, axillary; pedicels very short, jointed near the base, purple; involucral bracts 10, lanceolate, shorter than the calyx, purple; calyx up to 3 cm long, red to dark purple, fleshy, lobes 9–10, to 1.8 cm long, lanceolate, 3-nerved, connate at base; corolla pale yellow with a dark crimson or purplish-brown centre. Capsule ovoid, beaked, hairy or glabrous, shorter than the calyx, to 2 cm long and 1.8 cm wide; seeds numerous, reniform, *c.* 5 mm long and 4 mm wide, brownish-black, covered with minute, stout, stellate hairs.

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Distribution and habitat

Native to tropical Africa and Asia. Numerous varieties are cultivated as a vegetable or for fibre throughout the tropics, including most parts of India at lower elevations; occasionally naturalized. The two most common varieties cultivated in India are *H. sabdariffa* var. *sabdariffa* and *H. sabdariffa* var. *altissima*; it grows well on moderately fertile, well-drained soils in humid tropical regions.

Medicinal properties and uses

An infusion of the calyx of *H. sabdariffa* var. *sabdariffa* is used to prepare a cooling, refreshing beverage with an agreeable acid taste which aids digestion and is useful for treating bilious conditions. It has diuretic and choleretic properties and acts as an intestinal antiseptic and mild laxative; it is used to treat heart and nerve diseases, high blood pressure and calcified arteries. The leaves, seeds and ripe calyces all have diuretic and antiscorbutic properties. The leaves are considered emollient.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935).

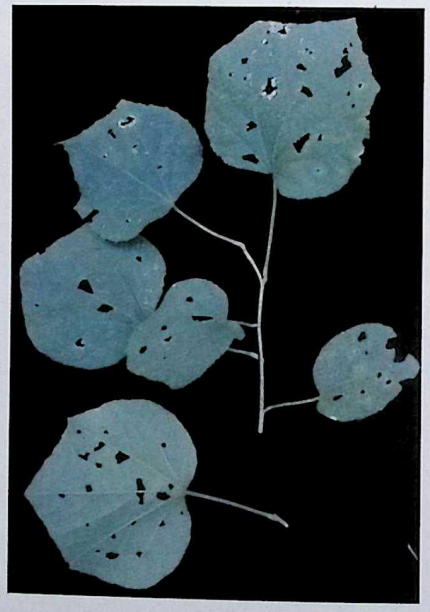
Kydia calycina Roxb.

Botanical synonyms

Kydia fraterna Roxb., *K. roxburghiana* Wight.

Common names

Bengali: bankopas, bonkopas, pala, pola; ***English***: pula; ***Gujarati***: mhotihirwani, motihirvani, nihotilirwani, petari, varang; ***Hindi***: choupultea, pathra, polao, pula; ***Kannada***: bellaka, bendi, billubhendy, nayibende; ***Konkani***: varang; ***Malayalam***: nedunar, velukku, venda, venta; ***Marathi***: bhoti, iliya, potari, ranbhendi, warang, warung; ***Oriya***: bankopasia, bharimo, khopashya, kopasia; ***Punjabi***: pola, pula, puliyan; ***Tamil***: bendi, pula, vattakannu, vendai; ***Telegu***: kondapotari, pachabotuka, potari, potri.



Description

A small or medium-sized deciduous tree up to 12 m tall; bark grey, exfoliating in irregular flakes or long, thin strips. Leaves alternate, 7.5–15 cm long and wide, usually 3–7-lobed, apex angled or rounded, base cordate, palmately 7-nerved, hoary-tomentose beneath; petioles 2.5–5 cm long. Flowers borne in branched, tomentose panicles; pedicels 9 mm long; involucral bracts 4–6-nerved, 6–9 mm long in fruit; calyx 5-lobed, sepals ovate; corolla greenish-white, pink or purplish, petals emarginate, exceeding the calyx, clawed, with a tuft of hairs at each side of the base of the claw. Capsules small, globose, 3-valved, tomentose, containing dark brown, striate, reniform seeds. In central Indian deciduous forests, flowering occurs between August and October; fruits mature from November to January.

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Distribution and habitat

Found in the tropical Himalayas from the Indus eastwards to Myanmar (Burma), and in peninsular India from northern Maharashtra and Madhya Pradesh southwards, chiefly in mixed, moist, deciduous forests.

Medicinal properties and uses

Among the Santalis, a paste of the pounded leaves is applied to relieve body pains, arthritis and lumbago; a poultice of the leaves is reportedly used to treat skin diseases.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935).

Malvastrum coromandelianum (L.) Gaercke

Botanical synonyms

Malva coromandeliana L., *M. tricuspidatum* (Ait. f.) A. Gray, *Malvastrum tricuspidatum* (R. Br.) A. Grey

Common names

None reported.

Description

A decumbent-ascending or erect perennial herb or undershrub 0.6–0.9 cm high with a woody base; branches covered with longitudinally arranged, appressed, 4-branched white hairs. Leaves 2–6.5 cm long and 0.8–4 cm wide, ovate to lanceolate, apex acute to obtuse, base acute or obtuse to rounded or truncate, margins irregularly toothed, 5-nerved at the base, hirsute above, stellately hairy on major veins below; petioles 0.5–4 cm long, flattened or slightly channelled above, densely hairy; stipules 2–5 mm long, linear or lanceolate, acuminate, entire or serrate. Flowers solitary or 2–3 together in

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leaf-axils; peduncles 0–12 mm long; bracteoles 3, linear, 3–5 mm long; calyx campanulate, 7–9 mm long and 10–12 mm in diameter, lobes 5, triangular, acute, stellately hairy; corolla pale yellow to orange-yellow, *c.* 1.5 cm in diameter, petals obovate, apex rounded or emarginate. Carpels 8–14, curved, 2–2.5 mm long with sharp dorsal edges, bearing 2 outwardly directed awns and another at apex, 0.5–1 mm long; seeds *c.* 1.5 mm long, reniform.

Distribution and habitat

Native to tropical America; introduced and naturalized throughout the Old World tropics. In India it is found as a common weed on degraded lands and roadsides from Uttar Pradesh and West Bengal southwards to Tamilnadu.

Medicinal properties and uses

In the West Indies, the plant is considered to have emollient and resolvent properties. The leaves are applied to inflamed sores and wounds as a cooling and healing salve. The flowers are reportedly given as a pectoral and diaphoretic.

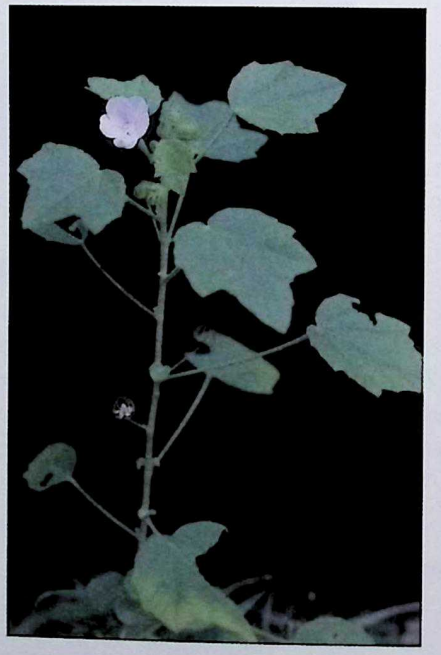
References

Chopra *et al.* (1956), Kirtikar *et al.* (1935).

Pavonia odorata Willd.

Common names

Bengali: sugandhabala; ***Gujarati***: kalowalo; ***Hindi***: sugandhabala; ***Kannada***: balarakkasi, mudivala, peramutiberu; ***Malayalam***: kuruntotti; ***Marathi***: kalavala, sughandabala; ***Oriya***: karumuli; ***Sanskrit***: bala, valakah; ***Tamil***: avibattam, peramutti, suvesagam; ***Telegu***: chittibenda, errakuti, ettakuti, muttavapulagamu, tigebenda.



Description

An erect, annual, woody herb or undershrub to 1 m high; stems and branches glandular-pubescent. Leaves 0.8–6.5 cm long and 0.6–6.5 cm wide, ovate-suborbicular, shallowly 3–5-lobed, lobes ovate, basally 5-veined, base cordate, apex acute, margins dentate or lower leaves entire, stellate-hairy on both surfaces, often felted and whitish beneath; petioles 0.5–6 cm long, lower ones longer than leaf blades; stipules 2 mm long. Flowers solitary or paired, axillary, fragrant, pink or white, 1.5 cm in diameter; bracteoles 10–12; sepals lanceolate; petals 1–1.5 cm long and 0.5–0.6 cm wide. Fruits 2-chambered, each chamber containing a single oily, brown seed. The roots have a musk-like odour. Flowers and fruits from July to January.

Distribution and habitat

Occurs naturally in India, Myanmar (Burma), Sri Lanka and tropical East Africa. Common throughout northwest, central and southern India in deciduous forests and open, degraded habitats. Often cultivated in gardens for its fragrant flowers, and sometimes for its edible leaves.

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Medicinal properties and uses

The aromatic roots are considered astringent, antipyretic, demulcent, stomachic, cooling, diaphoretic and diuretic. They are used as an astringent and tonic in the treatment of dysentery, intestinal inflammation and haemorrhage; bruised and mixed with *ghee* (butter fat), they are applied in the form of a poultice to treat erysipelas. The paste mixed with dehusked rice water acts as an anti-emetic. The plant is reportedly used as a cure for rheumatism. In southern Orissa, the leaf juice, mixed with black pepper, is given orally to treat dysentery in infants. In Ayurveda, it is used as a substitute for *Sida cordifolia*, the roots of which form the drug *Bala*, used to relieve pain and treat nervous disorders, coryza and cardiac disease. In Siddha, the whole plant forms the drug *Peramutti*, used to treat rheumatic fever, oliguria and cough. The roots are sometimes used in Indian perfumery.

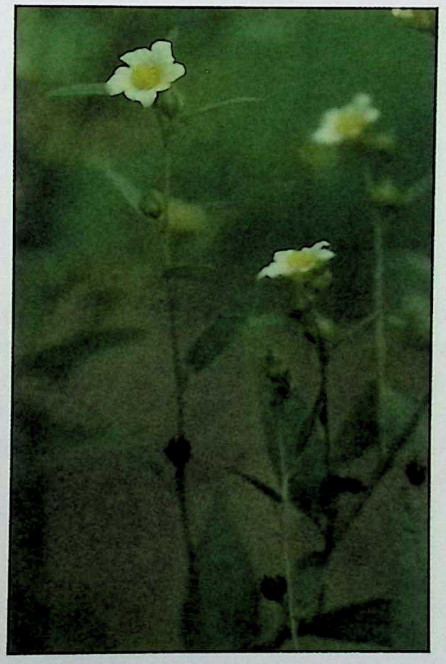
References

Chatterjee and Pakrashi (1992), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935), Mohanty *et al.* (1996), Sivarajan and Balachandran (1994), Yoganarasimhan (1996).

Sida acuta Burm. f.

Botanical synonyms

Sida acuta var. *carpinifolia* (L. f.) Shumann, *S. carpinifolia* L. f., *S. lanceolata* Retz.



Common names

Bengali: bonmethi, pilabarelashikar, svetberelakoreta; ***Gujarati***: bala dungaraubel, bala janglimethi; ***Hindi***: bariara, kharenti, kungyi, paharibariara; ***Kannada***: bhimankaddi, cheruparuva, malatanni, vishakaddi; ***Malayalam***: malatanni, shiruparuva; ***Marathi***: bala, chikana, palambasi, pata, tukati, tupkaria; ***Oriya***: ancharna, siobola, sunakhodika; ***Punjabi***: bariara, karenta; ***Sanskrit***: bala, pata; ***Tamil***: vattatiruppi; ***Telegu***: visaboddi.

Description

A shrubby annual or perennial herb up to 1.5 m tall, with slender branches covered with minute, grey, stellate hairs. Leaves simple, alternate, 1.5–7.5 cm long and 0.5–2.5 cm wide, lanceolate to linear, apex acute, margins serrate, base subcordate or rounded, minutely stellate-hairy on both surfaces, pinnately veined; petioles 0–6 mm long, slender; stipules 3–9 mm long and 0.3–1.3 mm wide, linear. Flowers pale yellow or orange, axillary, solitary or in clusters of 2–3; calyx 5–9 mm diameter, campanulate, 5-lobed, lobes *c.* 3 mm long and 3–4 mm wide, triangular; corolla 12–20 cm diameter, petals 9–10 mm long, obovate. Fruit 5–6 mm in diameter, mericarps 5–11, 2–2.5 mm long with 2 awns 1–2 mm long at apex, glabrous; seeds *c.* 2 mm long, glabrous, dark brown. Flowers between August and October and fruits from September to November in central India.

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Distribution and habitat

Pantropical in distribution, found throughout tropical and subtropical India in fields, along roads and forest edges, and in secondary forests.

Medicinal properties and uses

The root has astringent, cooling and tonic properties, and is used in Ayurveda to treat nervous and urinary diseases and disorders of the blood and bile. Intensely bitter, it is used as an infusion and in conjunction with ginger to treat intermittent fever; it is also used as a stomachic, to treat chronic bowel complaints, and as an aphrodisiac. The leaves, warmed and moistened with sesame seed oil, are used to hasten suppuration. The crushed leaves are applied externally to promote healing of bone fractures among the tribal inhabitants of Maharashtra. The expressed juice of the leaves is reportedly used in Bengal in the form of an electuary to treat intestinal worms.

References

Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Sivarajan and Balachandran (1994), Upadhye *et al.* (1994).

Sida cordata (Burm. f.) Borssum

Botanical synonyms

Melochia cordata Burm. f., *Sida humilis* Cav., *S. humilis* var. *veronicaefolius* (Lam.) Masters, *S. multicaulis* Cav., *S. veronicifolia* Lam.

Common names

Bengali: junka; ***Gujarati***: bhonyabal, bhoybala; ***Hindi***: bananiyar, bhiunli, kharenti; ***Kannada***: bekkenatalegida; ***Marathi***: bhoybal, bhuichikna; ***Oriya***: biskhapuri; ***Sanskrit***: bhumibala, nagabala; ***Tamil***: palampasi; ***Telegu***: gayapuwaku.

Description

A prostrate or decumbent-ascending, more or less hairy, perennial herb to 0.5 m tall, rooting at nodes, often with a woody base. Leaves simple, alternate, 1–5 cm long and 1–5 cm wide, orbicular to ovate, base shallowly cordate, apex acute or acuminate, margins crenate-serrate with alternate, short teeth, glabrate or thinly stellate-hairy on both surfaces, palmately 5–7-veined; petioles 0.5–3 cm long, hairy; stipules 1–3 mm long, linear to filiform, hairy. Flowers axillary, 1.3–1.5 cm across, pale yellow, solitary on jointed pedicels 1.2–3.8 cm long in the axils of leaves or in pairs on short branchlets; calyx 3.5–4 mm long, campanulate, 5-angular, lobes 2–3 mm long and 1.5–2.5 mm wide, triangular-acuminate; corolla 8–10 mm diameter, petals obovate, slightly exceeding the calyx. Mericarps 5, 2–2.5 mm long, glabrous or shortly hairy at apex, usually awnless; seeds 2 mm long, ovoid, brownish-black, glabrous. This species is very closely allied to *S. mysorensis* Wight & Arn., which is characterized by

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an erect, stout habit and glandular hairiness of the leaves. Flowers and fruits throughout the year.

Distribution and habitat

A pantropical weed of open, grassy habitats, distributed throughout the hotter parts of India up to 1500 m elevation.

Medicinal properties and uses

The herb is considered to possess cooling, astringent and tonic properties and is used to treat fever and urinary disorders. The leaf juice is reportedly effective for treating diarrhoea during pregnancy, and the pounded leaves are applied locally to relieve cuts and bruises. A poultice of the leaves is used by the Santhalis to promote healing of cuts and bruises, and the warm plant paste to heal boils. The flowers and unripe fruits are mixed with sugar and taken internally to relieve a burning sensation in urination. The root bark is used in the treatment of leucorrhoea and gonorrhoea. The roots, pounded with those of *Celastrus paniculatus* (*Celastraceae*), are taken orally for amenorrhoea among the tribal inhabitants of Orissa.

References

Chatterjee and Pakrashi (1992), Chopra *et al.* (1956), CSIR (1948–1992), Jadeja (1999), Kirtikar *et al.* (1935), Sahoo and Mudgal (1995), Sivarajan and Balachandran (1994), Varma (1997).

Sida rhombifolia L. subsp. *rhombifolia* Borssum

Botanical synonyms

Sida orientalis Cav., *S. rhombifolia* (L.) var. *obovata* Wall. ex Masters, *S. rhombifolia* (L.) var. *rhomboidea* (DC.) Masters

Common names

Bengali: lalberela, pitabala, pithala, swetbarela; ***English***: broomjute sida; ***Gujarati***: baladana, khetraubat-atibala; ***Hindi***: atibala, pitabala, sahadeva, swetbarela; ***Kannada***: bennegaruga, bolamgadale, gubethadegida, kallagadale; ***Malayalam***: anakurunthotti, kuruntotti, valan-kuruntotti, vatturam; ***Marathi***: chikna, sadeda, sahadevi; ***Oriya***: dholabadiamla, nalobadianla; ***Sanskrit***: atibala, bala, mahabala; ***Tamil***: athibala chedi, chitra mutti, sirramutti, tenecham; ***Telegu***: athibala chettu, gubatada, mayilumanikyamu, muttavapulagamu.

Description

An erect, annual or perennial undershrub up to 1.5 m tall with strong, wiry, flexuose branches. Leaves simple, alternate, 3.5–10 cm long and 1–5 cm wide, highly variable in size and shape, usually rhomboid-lanceolate, apex acute, acuminate or obtuse, base cuneate or rounded, margins serrate, glabrate or stellate-hairy above, grey-pubescent beneath, basally 3-nerved; petioles to 6 mm long, pubescent, swollen in the upper third. Flowers yellow or rarely

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white, 1–2 cm across, solitary or in 2–5-flowered clusters in leaf axils or on short branchlets; calyx campanulate, 5-angular, hairy, 5–6 m in diameter, lobes 1 mm long and 3 mm wide, broadly triangular, acuminate; petals 5.5–6 mm long, usually emarginate. Mericarps 9–12, 2.5–3.5 mm long, trigonous, sparsely pubescent, short- or long-awned with awns up to 1 mm long; seeds 1–2, *c.* 2 mm in diameter, subreniform, smooth, dark brown or black. Flowers from September to December and fruits from October to January in central India.

Distribution and habitat

A pantropical and subtropical weed, commonly found on open and degraded sites, and beside rivers and streams; cultivated throughout India, particularly in moist regions, up to 1800 m elevation in the Himalayas.

Medicinal properties and uses

The pounded leaves are applied as a paste to relieve swelling among the Mundas. The crushed fruits are used externally in the form of a paste to relieve headache among the Kondhs of southwestern Orissa. The mucilage obtained from the stem is used as a demulcent and emollient; it is also used internally as a diuretic and febrifuge and in the treatment of skin diseases. The root is highly valued in Ayurvedic medicine for treatment of rheumatism and forms the chief ingredient of several important compound preparations. It is considered demulcent, aphrodisiac and tonic; in addition to its use in treating rheumatism it is also used for neurological disorders such as hemiplagia, facial paralysis and sciatica, general debility, headache, ophthalmia, dysuria, leucorrhoea, tuberculosis, diabetes, fever and uterine disorders. The whole plant is used in the treatment of pulmonary tuberculosis and rheumatism in Europe. Both the roots and leaves reportedly contain ephedrine.

References

Chatterjee and Pakrashi (1992), Chopra *et al.* (1956), CSIR (1948–1992), Girach (1992), Kirtikar *et al.* (1935), Sivarajan and Balachandran (1994).

Thespesia lampas (Cav.) Dalz. & Gibs.

Botanical synonyms

Azanza lampas (Cav.) Alef., *Hibiscus lampas* Cav., *Thespesia macrophylla* Blume

Common names

Bengali: bankapas; ***Gujarati***: jangli-paraspiplo, paruspiplo; ***Hindi***: bankapasi, jangli-bhendi, kakhi; ***Kannada***: adavibende, turuve; ***Malayalam***: daraba, kattuparatti, katupavarasu; ***Marathi***: janglibhenda, ranbhendi; ***Oriya***: bonokopa; ***Sanskrit***: karpasi, vanakarpasah; ***Telegu***: adavibende, adavipratti, bharadvaji, kondapatti, pagadipatti, pattinga.

Description

A sparsely branched shrub up to about 3 m tall, with smooth, reddish-brown bark; young twigs minutely stellate-tomentose. Leaves cordate, lower usually palmately 3–5-lobed, upper often entire and ovate, 10–20 cm long and 8–18 cm wide, lobes triangular; basally 5–7-veined with finely reticulate secondary venation, sometimes with black glandular dots on the lower surface; petioles 0.5–12 cm long, densely stellate-tomentose. Flowers yellow with a crimson centre, 7–10 cm in diameter, borne 1–3 together at the end of long, axillary or terminal peduncles; pedicels 6–12 mm long; involucral bracts 5, subulate; calyx 6–8 mm diameter, cupular, with 4–6 small, subulate teeth or lobes arising from rim; corolla campanulate, petals 6–7 cm long and 5–6 cm wide, obovate, apex rounded. Fruit (capsule) 2–3 cm long, ovoid, pointed, 4–5-valved, woody, villous, dull black; seeds numerous, 4 mm long and 2.5 mm wide,

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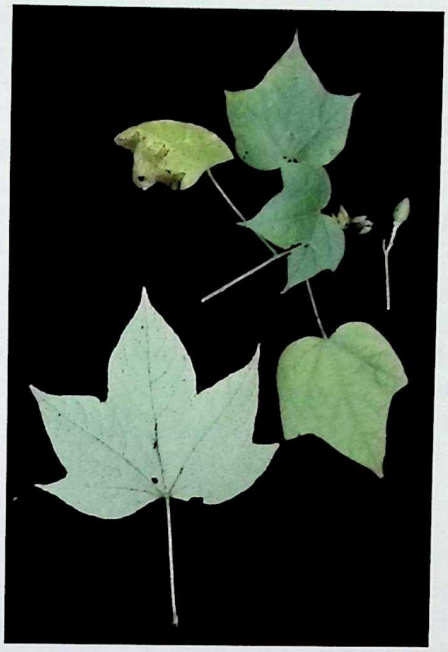
obovoid, glossy, dark brown or black. In central India, flowering occurs mainly between August and October and fruiting from November to January.



Distribution and habitat

Found from India and Sri Lanka eastwards through Myanmar (Burma) and Malesia (except Malaysia) to Australia; also occurs in tropical East Africa. Common throughout India up to 1200 m elevation, typically in secondary deciduous forests. It grows well on a variety of soils in areas receiving approximately 1500 mm annual rainfall; sometimes planted as an ornamental shrub.

Medicinal properties and uses

The roots and fruits are reportedly used for treating gonorrhoea and syphilis in Chota Nagpur. The floral parts are marketed as a drug, and used, like those of *Thespesia populnea*, for treatment of skin affections such as scabies, psoriasis, ringworm, guinea worms and eczema. The young stems yield a useful reddish fibre, and the flowers contain a dye used to colour wool.

References

Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935).

Thespesia populnea (L.) Sol. ex Correa

Botanical synonyms

Hibiscus bacciferus J.G. Forster, *Malvaviscus populnea* (L.) Gaertn., *Thespesia populneus* L.

Common names

Bengali: dumbla, gajadanda, palaopipal, palaspipal, pares, parespipal, porash; ***English***: Indian tulip tree, portia tree; ***Gujarati***: bhindi, paraspipdo, parsapeepla; ***Hindi***: bhendi, gajadanda, paras-pipal, parsipu, porush; ***Kannada***: adavi-bendi, arasi, huvarasi, jogiyarale, kandarola; ***Konkani***: benndy, maner; ***Malayalam***: chilanti, kallal, porasu, pupparutti, puvarasu; ***Marathi***: bhendi, bhendi-ke-jhar, parsachajhada; ***Oriya***: gunjausto, porosopippoli; ***Punjabi***: paharipipal, paraspipal; ***Sanskrit***: parisa, parisah, parisha; ***Tamil***: cheelanthi, poris, purasia, pursa, puvarasam, puvarasu; ***Telegu***: gangaravi, gangareenu, gangareni, munigangaraavi.

Description

An evergreen shrub or small tree, usually 4–10 m tall; bark grey to brownish, fissured, often scaly, fibrous; twigs densely covered by small brown or silver scales. Leaves 6–15 cm long and 5.5–13 cm wide, deltoid, suborbicular to broadly ovate, base cordate, apex acuminate, margins entire, leaf blade dark green and covered with rusty scales, venation finely reticulate with 5–7 prominent nerves arising from the base; petioles 5–10 cm long; stipules subulate, deciduous. Flowers large (5–7.5 cm in diameter), showy, corolla yellow with a large purple spot at the base, fading to

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pinkish-red; pedicel 2–8.5 cm long, axillary; calyx cupular, 12–18 mm in diameter, covered with minute peltate scales, teeth 5, minute; corolla campanulate, petals 6–7 cm long and 4.5–6 cm wide, obovate, apex rounded. Fruits (capsules) brown, globose or oblong with a persistent calyx, 2–4.5 cm in diameter, covered with minute peltate scales; seeds 1–11, flat, ovoid, 9 mm long and 5.5 mm wide, channelled along the back, glabrous or rusty-pubescent. Flowers between October and January in central India.

Distribution and habitat

A pantropical coastal species apparently native from the east coast of Africa to Polynesia between 30°N and 23°S latitudes. Commonly found in coastal forests of India and the Andaman islands, but planted elsewhere in India as an ornamental tree. The tree prefers light, porous soils, particularly sands, but can tolerate stony or other coarse-textured soils; it is well-adapted to saline soil conditions.

Medicinal properties and uses

The bark, leaves, flowers and fruits are used externally for the treatment of skin diseases such as eczema, scabies, psoriasis, ringworm and guinea worm. In Ayurvedic medicine, the bark is the official source of the drug *Parisha*, a reputed remedy for skin diseases, and an ingredient of Ayurvedic preparations such as *Aranyatulasyadi* coconut oil and *Yastimadhukadi tailam*. It is considered light, acrid, cooling and astringent and is also used for treatment of dysentery, piles and diabetes. The mashed bark is used as a poultice or hot fomentation to promote healing of wounds. A decoction of the bark is given internally as an alterative, and as an external wash in the treatment of skin diseases. The root, although reportedly toxic, is considered tonic; it is used in Ayurveda to treat heart diseases and throat ailments. The leaves are reportedly used as a hot poultice to relieve inflamed and swollen joints. In the Konkan, the flowers are used externally to relieve

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itching. The yellow juice of the fruits is used as a local application in the treatment of scabies and other skin diseases; it is also considered useful for treating certain hepatic diseases. A decoction of the fruits is considered an antidote for poisoning. The seeds yield a deep-red, thick, fatty oil which is also used in treating skin diseases. A compound oil prepared from the bark and fruit capsule is reportedly useful in urethritis and gonorrhoea. The seeds possess purgative properties. The tree produces a useful timber, and the bark yields a strong fibre used for cordage, fishing lines, sacks, and for caulking boats. Both the flowers and capsules yield a water-soluble, yellow dye that is used to colour silk, wool and tasar (a type of raw silk).

References

Chatterjee and Pakrashi (1992), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935), Ragupathy and Mahadevan (1991), Sivarajan and Balachandran (1994), Yoganarasimhan (1996).

Urena lobata L.

Botanical synonyms

Urena lobata L. subsp. *lobata*, *U. trilobata* Vell.

Common names

Bengali: benochra; ***Hindi***: bachata, bachita, brachta, lapetua, pithia, unga; ***Kannada***: otte; ***Konkani***: villiah; ***Malayalam***: udiram, uram, uran, vatto; ***Marathi***: rantupkada, rantupkuda, vanabendha, van bhendi; ***Oriya***: bilokapasiva, jotyaholo; ***Sanskrit***: atibala, bala, nagabala, vanabhenda; ***Tamil***: ottatti, ottututti; ***Telegu***: peddabenda.

Description

An erect, variable, stellate-pubescent to stellate-tomentose herb or undershrub up to 2.4 m tall. Leaves variable in size and shape, roundish or ovate, angled or shallowly lobed, 1–10 cm long and wide, base cordate, palmately 3–9-veined from base with linear, extra-floral nectaries (glands) at base of midrib beneath, margins serrate to crenate, lobes generally acute or acuminate; petioles variable in length, 0.5–6 cm long, densely hairy; stipules 1.5–4 mm long, linear-lanceolate, acute. Flowers bright pink, borne in axillary clusters, sometimes forming leafless, terminal, racemes; involucral bracts to 6 mm long, equalling or exceeding the calyx and alternate with its lobes, linear-oblong, acute, united at the base into a cup, rigidly hairy; calyx deeply divided, lobes less than 6 mm long, lanceolate, ciliate; corolla 2–3 cm in diameter, petals *c.* 1.5 cm long, pink or rose-purple, dark purple at base, obovate. Fruits (capsules) *c.* 1 cm long, depressed-globose, indehiscent, densely pubescent, covered with blunt spines, each spine having 2 straight bristles pointing downwards; seeds rounded on the back, wedge-shaped on the inner side,

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smooth. Flowers during the rainy season (July–September); fruits ripen during the winter months (November–January).

Distribution and habitat

A pantropical weed, it is found throughout the tropical and subtropical regions of India on degraded sites, along roads and in forest clearings. Occasionally cultivated, mainly for production of the fibre obtained from the stem.

Medicinal properties and uses

The whole plant, boiled in sesame oil or pounded into a paste with garlic, is applied externally to relieve rheumatic pains among the tribal inhabitants of western Maharashtra and southern Andhra Pradesh. The root is considered diuretic and tonic and is used in Ayurveda to treat cough, dysuria, diabetes, fever, thirst, dysmenorrhoea, piles, diarrhoea and worms; it is also used as an external remedy for rheumatism by the inhabitants of Chota Nagpur. A poultice of the tender leaves is used to promote the healing of wounds.

References

Chatterjee and Pakrashi (1992), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Sivarajan and Balachandran (1994), Upadhye *et al.* (1994), Vijaya Kumar and Pullaiah (1998).

Urena sinuata L.

Botanical synonym

Urena lobata subsp. *sinuata* (L.) Borssum Waalkes

Common names

Bengali: kunjia; ***Hindi***: kunjuya, lotloti; ***Malayalam***: uram; ***Marathi***: lichi, ran kapasi; ***Sanskrit***: bala; ***Tamil***: ottatti, ottututti; ***Telegu***: nallabenda, padanikada, piliyamankena.

Description

A more shrubby variety of the preceding species, 0.5–1.3 m tall. Leaves very variable, with most being more deeply divided than those of *Urena lobata*, 2.5–8 cm long, orbicular in outline, 3–5-veined from base, with extra-floral nectaries at the base of the midrib beneath, more or less stellate-hairy on both surfaces, base cordate or truncate, irregularly lobed to below the middle; lobes 3–5 or more, dilated upwards, with rounded sinuses, margins serrate, pale beneath; petioles 0.3–5 cm long. Flowers rose-coloured, 2–2.5 cm in diameter; involucral bracts *c.* 6 mm long, linear-oblong, acute, alternate with the calyx lobes; calyx lobes 6 mm long and 1.5–2 mm wide, obovate-lanceolate, acuminate; petals *c.* 1.5 cm long, pink, dark rose at base. Fruits and seeds the same as those of *Urena lobata*. The two species are distinguished by their epicalyx bracteoles: linear-lanceolate, flexible, reflexed, 3–4 mm long and 1–1.5 mm wide in *U. sinuata*; broader, stiff, triangular, acute, 4.5–5 long and 1–1.5 mm wide, appressed to monocarp in *U. lobata*. Flowering and fruiting occur between July and January.

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Distribution and habitat

Occurs throughout the hotter parts of the country as a weed on degraded sites and in forest clearings.

Medicinal properties and uses

The roots are considered emollient and cooling. In Chota Nagpur they are used in external applications to treat lumbago. The leaves are prescribed in cases of intestinal and bladder inflammation in the Philippines. In Brazil, a decoction of the plant is used to relieve colic and an infusion of the flowers is used to treat bronchitis.

References

Chatterjee and Pakrashi (1992), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935).

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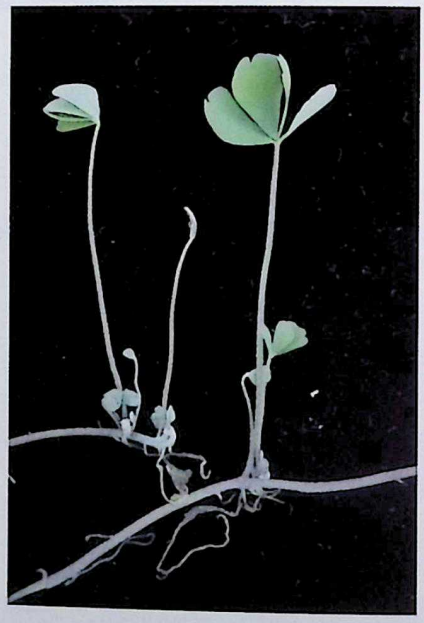
Marsileaceae

Marsilea minuta L.

Common names

Bengali: susnishak; ***Hindi***: chaupatira; ***Kannada***: chitigina soppu; ***Malayalam***: niraral; ***Punjabi***: godhi, tripattra; ***Sanskrit***: sunisannah, sunisannaka; ***Tamil***: araikeerai; ***Telegu***: chick-lintakura, mundugo-tamara.



Description

An aquatic herb with slender, creeping rhizomes. Leaves quadrifoliate with long slender petioles; leaflets obovate-retuse, glabrous, arranged in a whorl. Fructifications (sporocarps) are dark brown, hard, bean-shaped, with two unequal horns. Flowers absent; fruits produced during the summer.

Distribution and habitat

Found throughout most of India, usually at the edges of ponds and irrigation channels and as a weed in wet fields and flooded lowlands throughout most of India.

Medicinal properties and uses

In Ayurveda, the plant is considered sweet, astringent, cooling, constipating, digestive and diuretic. The whole plant is used to induce sleep and as a sedative in mental and nervous disorders such as epilepsy. It is also considered aphrodisiac and is used as a blood-purifier, a treatment for cough, dyspepsia, piles and poisoning. It is an ingredient of several Ayurvedic preparations. Among the tribal inhabitants of eastern Bihar, the whole plant is eaten as a vegetable; the plant juice is used as an eyedrop for the treatment of eye diseases, and consumed as a tonic following recovery from fevers.

References

Chatterjee and Pakrashi (1991), Chopra *et al.* (1969), CSIR (1948–1992), Jha and Varma (1996), Kumar and Goel (1998), Sivarajan and Balachandran (1994).

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Melastomataceae

Memecylon umbellatum Burm. f.

Botanical synonyms

Memecylon edule Roxb., *M. tinctorium* Koen. ex Wight & Arn.

Common names

Bengali: anjani; ***English***: ironwood tree; ***Kannada***: alle, archana, archeti, harchari, huli soppu, lakhonde, udaballi; ***Konkani***: ronzoni; ***Malayalam***: anakkayavu, kalayam, kanila, kanalei, kannavu, kasavu, netunjetti; ***Marathi***: anjani, kuspa, limba; ***Oriya***: bonohorono, horono, nirassa, niroso; ***Sanskrit***: anjani; ***Tamil***: alli, anjani, kasai, kava, pungali, sirugasa; ***Telegu***: alli, kikkalli, midalli, uddalalli.

Description

A large ornamental shrub or a small tree; bark greyish with vertical furrows. Leaves ovate or elliptic, 3.8–7.5 cm long and 1.6–3.8 cm wide, apex subacute or shortly and bluntly acuminate, base usually attenuated or sometimes rounded, margins entire or slightly revolute, midrib prominent, lateral nerves obscure; petioles 2.5–5 mm long. Flowers numerous, bright blue, borne in short-stalked (to 1.5 cm long), axillary umbels; calyx 2.5 mm long, campanulate before expansion, saucer-shaped when expanded, 3 mm across when flowering. Fruits (berries) rounded, purplish or black when ripe, to 6 mm in diameter, 1–2-seeded. Flowers from March to April and fruits during the rainy season.

Distribution and habitat

Occurs naturally in the coastal regions of western peninsular India and in evergreen, semi-evergreen and moist deciduous forests of south India, Sri Lanka, the Andaman Islands, Orissa, Assam, Bangladesh, Myanmar (Burma), Thailand, Indochina, Malaysia, Sumatra, Java and Borneo. Grown in gardens for its ornamental flowers.

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Medicinal properties and uses

The pulpy fruits are astringent and edible. The leaves possess cooling and astringent properties; in Ayurvedic practice, their infusion is used as a lotion or eyewash to treat conjunctivitis, and given internally to treat leucorrhoea and gonorrhoea. A decoction of the root is used in small doses to treat menorrhagia and gonorrhoea. The leaves and bark are applied to soothe bruises. Among the tribal inhabitants of western Maharashtra, a poultice prepared from the stem bark, black pepper and the ground root of *Curcuma amada* (*Zingiberaceae*) is used as an anti-inflammatory. The leaves yield a good-quality yellow dye.

References

Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Nadkarni (1954), Upadhye *et al.* (1994), Yoganarasimhan (1996).

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Meliaceae

Azadirachta indica A. Juss.

Botanical synonyms

Antelaea indica (L.) Adelb., *Melia azadirachta* L., *M. indica* (A. Juss.) Brandis

Common names

Bengali: nim, nimgachh; ***English***: Indian lilac, margosa tree, neem tree; ***Gujarati***: danujhada, limbado, limbra. limdo; ***Hindi***: nim, nimb; ***Kannada***: bemu, bevinamara, bevu, kaybevu; ***Konkani***: nim; ***Malayalam***: aryaveppu, nimbam, veppa, veppu; ***Marathi***: kadukhajur, limba; ***Oriya***: kakapholo, limbo, nimba, nimbu, nimo; ***Punjabi***: bakam, drekh, nim; ***Sanskrit***: arishta, nimba, nimbah, picumarda; ***Tamil***: vembu, vepa, veppam; ***Telegu***: veepa-chettu, vepa, yapa, yapachettu, yepa; ***Urdu***: neem.

Description

A medium-sized to large, usually ever-green, tree up to 25 m tall, with a straight bole and long, spreading branches forming a broad crown. Bark grey or dark grey, rough, reddish-brown inside, with numerous oblique furrows and scattered tubercles. Leaves alternate, imparipinnate, 20–38 cm long; leaflets 4–7 pairs, opposite or subopposite, 3.5–10 cm long and 1.2–4 cm wide, asymmetrical, lanceolate to ovate, glossy, margins coarsely serrate, apex acuminate, base very unequal, glabrous green above, pale beneath. Flowers greenish-white or pale yellow, small, scented, numerous, in long, slender, very lax, axillary panicles. Fruits (drupes) green, turning yellow on ripening, aromatic with a garlic-like odour, oblong or ovoid-oblong, smooth, 1.3–1.8 cm long, with a single exalbuminous seed. Flowers mainly between January and April in peninsular India; fruits mature between April and August, depending on locality. In decidu-

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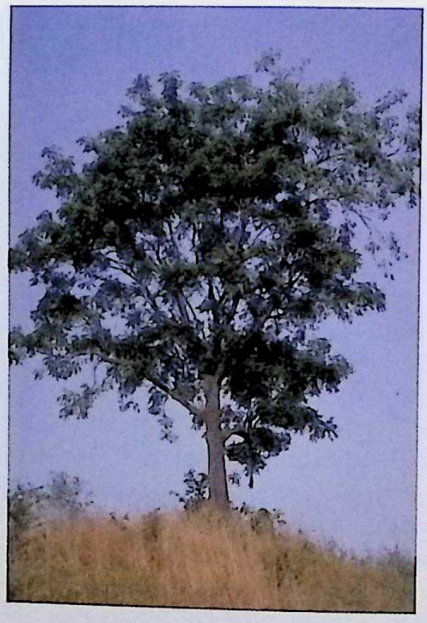
ous forest zones of central India the leaves fall and are replaced between February and March.



Distribution and habitat

Neem is considered native to dry forest areas of the Indian subcontinent and possibly in the dry regions of the Irrawaddy valley in Myanmar (Burma). In India it occurs naturally in the Siwalik hills in northern India and in dry forests of Andhra Pradesh, Tamilnadu and Kannada to an altitude of approximately 700 m. It is considered to be an auspicious tree, highly valued for its medicinal and other uses, and is cultivated and frequently naturalized throughout the drier regions of tropical and subtropical India, Pakistan, Sri Lanka, Thailand and Indonesia. It is also grown and often naturalized in peninsular Malaysia, Singapore, the Philippines, Australia, Saudi Arabia, tropical Africa, the Caribbean, Central and South America. The tree grows on almost all kinds of soils, including clayey, saline and alkaline soils, and thrives better than most other trees on dry, stony, shallow soils, or on sites with a hard calcareous or clay pan near the surface. It does not tolerate inundation.

Medicinal properties and uses

Neem is among the best known and highly valued plant species in traditional Indian medicine. Almost all parts of the tree are used medicinally; the bark, leaves and seeds have been used to treat skin diseases and rheumatism since time immemorial. Neem extracts are reported to possess antidiabetic, antibacterial and antiviral properties and have been used successfully to treat stomach worms and ulcers. The stem bark, young fruits and, especially, the root bark possess astringent, tonic, alterative and antiperiodic properties. The fruit is used as a tonic, antiperiodic, purgative, emollient and an anthelmintic. The unripe fruits are used in Ayurveda to cure urinary discharges, skin diseases, tumours, piles and toothache. The dry fruits are bruised in water and used to treat skin diseases. The greenish-yellow to brown oil obtained from the seeds, called *margosa* or *neem oil*, has a strong, unpleasant odour resembling garlic. It has many therapeutic uses and is used extensively in the Indian pharmaceutical industry; its medicinal properties are attributed to the presence of bitter principles and odorous compounds. It is a useful remedy in some chronic skin diseases and ulcers, and is commonly applied externally to treat arthritis, leprosy and sprains. It is reportedly useful in the treatment of diabetes. Intrauterine medication with the oil controls various types of metritis. The warm oil relieves ear troubles and cures various tooth and gum diseases. A few

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drops of oil taken in betel (*Piper betle*: *Piperaceae*) leaf provides relief for asthma. The oil is reported to have antifertility, antiseptic and antifungal properties. The leaves possess anthelmintic, alexiteric and insecticidal properties. They are used in Ayurvedic medicine for treating ophthalmia, biliousness and skin diseases; their infusion is used as an antiseptic wash to promote the healing of wounds and ulcers. The tender leaves, along with black pepper, are reportedly effective for treating intestinal helminthiasis. A paste of the leaves is used to treat wounds, ringworm, eczema, and ulceration associated with cowpox; the fresh leaves are applied as a poultice to relieve boils. Among the Baigas in northeastern Madhya Pradesh, the leaf paste is applied externally to treat chickenpox and measles. Fresh, mature leaves along with the seeds of *Cullen corylifolium* and *Cicer arientinum* (both *Fabaceae-Papilionoideae*) are used to prepare a very effective medicine for leucoderma. A poultice of the leaves along with those of *Capparis sepiaria* (*Capparaceae*) and tamarind (*Tamarindus indica*: *Fabaceae-Papilionoideae*) is used by the Bhils to treat night blindness. The leaf juice is given internally to treat piles, jaundice and fever among the rural and tribal inhabitants of Bhavnagar District in Gujarat. An aqueous extract of the tender leaves reportedly possesses antiviral properties effective against vaccinia (cowpox), variola (smallpox), varicella (chickenpox), and Newcastle-disease (foul-pest) viruses. The essential oil extracted from the leaves possesses mild fungicidal and marked antibacterial properties. The leaf juice is given to treat boils and fever among the tribal inhabitants of Surguja District in eastern Madhya Pradesh; in this region, the juice of the flowers is taken to stop vomiting. The dried flowers have tonic, purgative and stomachic properties, and are one of the constituents of the drug *Amber mezhugu*, which is used to treat arthritis. The bitter bark is reported to be beneficial in malarial fever and useful in the treatment of skin diseases, ulcers and inflammations. Among the Santhalis and Paharia of eastern Bihar, an extract of the fresh stem bark, crushed with the leaves and roots of *Cissampelos pareira* (*Menispermaceae*) and *Aristolchia indica* (*Aristolochiaceae*), is used as a nosedrop to treat patients undergoing epileptic seizures. The gum obtained from the cut bark exhibits proteolytic activity, is considered to have demulcent and tonic properties, and is used to treat catarrhal affections. In southern Orissa, it is dissolved in rice water and given to children to check diarrhoea. The sap is considered a refrigerant and alterative tonic used to treat chronic leprosy and other skin diseases, consumption, atonic dyspepsia and general debility. The young branches are anthelmintic and used in Ayurvedic practice to relieve cough, asthma, piles, tumours and urinary discharges. In addition to their medicinal properties, the leaves, fruits and seeds are valued for agricultural pest control as insecticides, nematocides and fungicides. Fresh or dried leaves are often stored with books and clothes as an insect repellent. *Neem seed oil* is used commercially in numerous cosmetic preparations.

References

Asolkar *et al.* (1992), Bhatt and Mitaliya (1999), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Joshi (1989), Kirtikar *et al.* (1935), Kumar and Goel (1998), Kumar and Jain (1998), Mohanty *et al.* (1996), National Research Council (1992), Sivarajan and Balachandran (1994), Verma *et al.* (1995).

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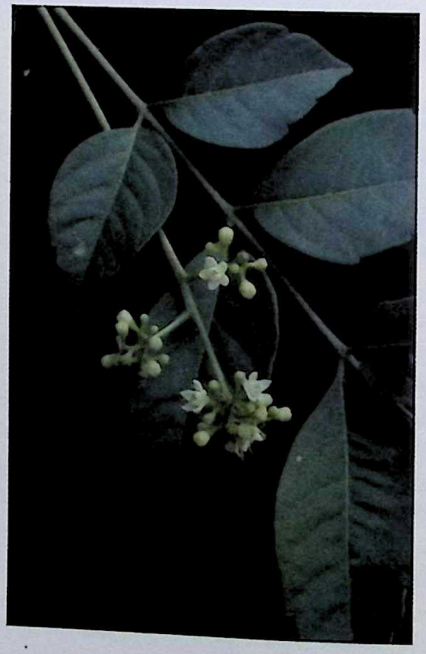
Cipadessa baccifera (Roth) Miq.



Botanical synonyms

Cipadessa cinarascens (Pellegrin) Hand.-Mazz., *C. fruticosa* Blume, *C. sinensis* (Rehd, & Wilson) Hand.-Mazz., *Melia baccifera* Roth, *M. integerrima* Wall. ex Voigt, *Rhus blinii* Lev.

Common names

Hindi: nalbila; ***Kannada***: chitundi; ***Oriya***: nahalbeli, ranabili; ***Tamil***: pulippan, pulippan cheddi, purudona; ***Telegu***: chend-bera, purudona.

Description

A much-branched shrub or small tree up to 6 m tall; bark smooth, mottled, finely lenticellate. Leaves imparipinnate; petioles up to 6 cm long; leaflets 4–7 pairs, opposite, 2–11 cm long and 1.5–4 cm wide, narrowly oblong to ovate, entire or irregularly dentate towards apex, base weakly asymmetric, acute or rarely rounded, apex acuminate; veins 6–9 pairs, prominent beneath, petiolules 0–8 mm long. Flowers small, sweetly scented, greenish to cream or white, densely pubescent, in axillary corymbose panicles 8–12 cm long. Fruit (drupe) globose, *c.* 5 mm in diameter, longitudinally grooved, reddish-brown when mature.

Distribution and habitat

Commonly found in parts of south India, Bihar, Orissa and in the eastern Himalayas up to 1500 m elevation, typically in ravines, rock crevices and in thickets and forest edge habitats.

Medicinal properties and uses

The roots are reportedly used to kill tapeworms.

References

Asolkar *et al.* (1992), CSIR (1948–1992).

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Melia azedarach L.

Common names

Bengali: ghoranim, mahanim; ***English***: bead tree, Persian lilac; ***Gujarati***: bakan limbodo; ***Hindi***: bakain, drek, mahanimba; ***Kannada***: arabevu, bevu, garudabevu, sikkabevu; ***Konkani***: vilayatinimb; ***Marathi***: padrai, pejri, vilayatinimb; ***Punjabi***: bakain, chein, dhek, drek, kachen; ***Sanskrit***: himadruma, mahanimba, mahanimbah; ***Tamil***: malaivembu, malaiveppam, sigarinimbam, titam; ***Telegu***: turakavepa, vettipeppa; ***Urdu***: bakayana.

Description

A small to medium-sized deciduous tree up to 12 m tall; bark greyish-brown, marked with long, shallow, vertical fissures. Leaves alternate, 23–50 cm long, pinnate near apex with a terminal leaflet, bipinnate or tripinnate nearer twig base; leaflets opposite, ovate-lanceolate, 1.2–6.5 cm long and 0.6–3.5 cm wide, tomentose, base oblique, cuneate, apex acuminate, margins entire or sometimes serrate; petiolules short, slender. Flowers lilac or purple and white, scented, 0.6–0.8 cm long in long-peduncled axillary cymose panicles. The fruit is a shining, subglobose drupe, 1.2–1.8 cm in diameter, greenish-yellow to yellow when mature, with a hard endocarp, containing a single seed. In central India, flowering occurs mainly from April to June and fruiting in November and December; trees remain leafless between December and May.

Distribution and habitat

Believed to be native to Baluchistan (Pakistan and Iran), but cultivated and naturalized throughout India and in many other countries in the tropics and subtropics.

Medicinal properties and uses

The root bark, fruit, flowers and leaves have deobstruent, resolvent and alexipharmic properties. The flowers and leaves are applied as a poultice to relieve nervous headaches; that of the flowers alone is used for treating eruptive skin diseases and for killing lice. The juice of the leaves, administered orally, is considered anthelmintic, antilithic, diuretic and emmenagogue; a decoction of the leaves is used as an astringent and stomachic. In

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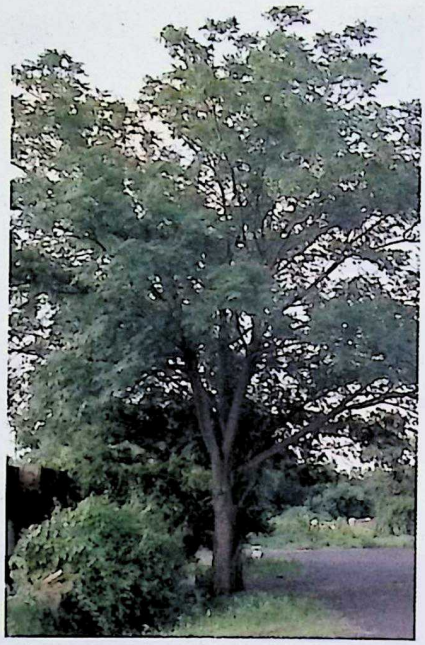

Punjab, the seeds are precribed for rheumatism; the seed oil is thought to possess similar properties to that of neem (*Azadirachta indica*). The gum collected from the cut bark, similar to that obtained from neem and wood apple (*Limonia acidissima*: *Rutaceae*), is considered useful for treating spleen enlargement. Among the tribal inhabitants of Surguja District in eastern Madhya Pradesh, a paste of the stem bark is applied to relieve swellings. An infusion of the bark is reportedly effective against ascariasis. The stone of the fruit is used throughout India as a bead for necklaces.

Warning

The fruits are considered poisonous to humans and livestock.

References

Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Kumar and Jain (1998), Sivarajan and Balachandran (1994).

Soymida febrifuga (Roxb.) A. Juss.

Botanical synonym

Swietenia febrifuga Roxb.

Common names

Bengali: rohan, rohina, rohra; ***English***: Indian redwood, rohań tree; ***Gujarati***: rohani, rohina; ***Hindi***: rakatrohan, rohan, rohun, rohunna; ***Kannada***: kalkarige, kemmara, sombi, some, somee gida, suani, sumbi; ***Marathi***: potar, ruhan, ruhin; ***Oriya***: karwi, sohan, sonhan, suam; ***Sanskrit***: patranga, rohini; ***Tamil***: shem, somadanum, sombu, surakkali, vandu; ***Telegu***: sevamano, sumi, somida, sonida manu; ***Urdu***: rohan.

Description

A tall, deciduous tree up to 25 m tall, with very tough, fibrous, greyish-brown bark that exfoliates in large plates or scales; underbark red; leafy twigs 6–11 mm diameter, lenticellate. Leaves compound (paripinnate), 22–45 cm long, clustered at the ends of twigs; petioles 5–7 cm long, weakly swollen at base; leaflets 3–9 with a terminal spike, opposite, very coriaceous, ovate to lanceolate or oblong, 5–10 cm long and 2–6.5 cm wide, apex rounded to obtuse or emarginate, base strongly asymmetric, margins entire; petiolules 0–7 mm long, grooved when dry. Flowers greenish-white in large terminal panicles 20–30 cm long

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with branches up to 18 cm long composed of pedunculate cymules of 1–3 flowers; sepals, *c.* 1–1.5 mm long, suborbicular, green; petals *c.* 3.5 mm long, ovate-oblong, creamy, base a longish claw. The fruits are glabrous, black, woody, pear-shaped capsules about 5–9 cm long with valves to 2.5 cm across, containing winged seeds *c.* 5.5 cm long and 1.5 cm wide, in 2 rows in each locule. In central India, flowering occurs between March and May and fruiting from May to June; trees remain leafless between February–March and April–May.

Distribution and habitat

Common in dry deciduous forests of peninsular India, Gujarat, Uttar Pradesh and Bihar. It is frequently found on dry, stony hills and on lateritic soils.

Medicinal properties and uses

The astringent bark is a popular drug in traditional Indian medicine, and is credited with antiperiodic properties. It is used in the treatment of diarrhoea, dysentery, and intermittent fevers, including malarial fever, and as a bitter tonic to treat general debility. A decoction of the bark is sometimes used to treat vaginal infections, and for enemas. It is given for the treatment of rheumatic swellings; the powdered bark is applied as a poultice for this purpose as well. In northeasern Karnataka the powdered bark is taken with rock salt to relieve urinary problems or, mixed with the leaves of *Pergularia daemia* (*Asclepiadaceae*) and sheep's milk, applied externally to promote healing of bone fractures. In this region, an extract of the bark is given to relieve stomach pain, and the leaf powder mixed with buttermilk is taken orally to increase lacta-

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tion. In addition to its medicinal properties, the bark is a rich source of tannins, used in the Indian leather industry. The bark forms the Ayurvedic drug *Mamsarohini*, used to promote blood coagulation, and to treat oedema, wounds, dental diseases, uterine bleeding, diarrhoea, dysentery, haemorrhage and malarial fever. A clear gum obtained from the cut bark forms a good adhesive mucilage.

References

Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Seetharam *et al.* (1999), Yoganarasimhan (1996).

Toona ciliata M.J. Roemer

Botanical synonyms

Cedrela toona Roxb. ex Rottler & Willd., *Toona australis* Harms, *T. microcarpa* (C. DC.) Harms, *T. ternatensis* (Miq.) Bahadur

Common names

Bengali: lud, tun, tuni, tunna; ***English***: Indian mahogany, sandal neem, toon; ***Hindi***: lim, lud, mahalimbu, tun, tuni; ***Kannada***: gandhagarige, garige, kalingi, mandurike, tundu, udimara; ***Malayalam***: akil, arana, devabaram, malarveppu, mathagiri vembu, tunnam, vedivembu; ***Marathi***: deodari, kuruk; ***Oriya***: mohalimbu; ***Punjabi***: bisru, dravi, khanam, tun; ***Sanskrit***: apina, tunah, tunna; ***Tamil***: santhanavembu, tevadaram, thevatharam, tunu; ***Telegu***: gali, nandi; ***Urdu***: tun.

Description

A medium-sized to large tree up to 35 m tall, with or without a buttressed base and a dense, shady crown; bark surface usually fissured and flaky, greyish-white to reddish-brown, with an aromatic odour when cut. Leaves pinnate, 30–45 cm long; leaflets 4–15 pairs, opposite or alternate, 5–15 cm long and 2–6.3 cm wide, lanceolate or ovate-lanceolate, apex acuminate, base unequal, the larger side rounded, the smaller acute, margins entire or undulate, glabrous; petiolules 6–12 mm long. Flowers white, honey-scented, in large drooping, pubescent panicles; buds ovoid or oblong; calyx divided nearly to the base, lobes orbicular-ovate, ciliate; petals 5 mm long, broadly elliptic, ciliate. Fruit (capsule) thinly woody, 5-valved, oblong, 2–2.5 cm long; seeds flat, winged at each end, about 2 cm long including the membranous wings. In central India, flowering occurs between February and April and fruiting from April to June; trees remain leafless between December–February and February–April.

Distribution and habitat

Native to tropical Asia from Pakistan, India, Nepal and Bangladesh through Myanmar (Burma) to southern China, Indochina, Thailand and throughout Malesia to northern Australia. Found in evergreen, moist and dry deciduous, sub-

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Himalayan forests from the Indus eastwards to Assam and southwards to Tamilnadu. It is frequently found on dry, stony hills and on lateritic soils.

Medicinal properties and uses

The bark is considered bitter, astringent to the bowels, aphrodisiac and tonic. It is used for treating fevers, itching, headache and biliousness in Ayurvedic practice, and for treating scabies and gleet in Unani medicine. The strong astringent properties of the bark make it useful for treating chronic infantile dysentery and, as a local application in various forms, to promote healing of ulcers.

References

Chopra *et al.* (1956, 1969), Kirtikar *et al.* (1935).

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Menispermaceae

Cissampelos pareira L. var. *hirsuta* (Buch. ex DC.) Forman

Botanical synonyms

Cissampelos convolvulacea Willd., *C. hirsuta* Buch. ex DC., *C. nepalensis* Rhodes., *C. subpeltata* Thwaites ex Miers

Common names

Bengali: akaleja, akandi; ***English***: velvet leaf pareira; ***Gujarati***: karandhiu, laghupaduvel, venivel, vang; ***Hindi***: akanadi, gayapar, harjori, kadh-nirbisi, karjeuri; ***Kannada***: kodupalli, pariraaberu; ***Malayalam***: kuttuvalli, malatanni, malathangi; ***Marathi***: pahadmul, pahad-velpaharvel; ***Oriya***: akarnamini, okanabindhu; ***Punjabi***: bat, bel, batindu path, katori, pilajari; ***Sanskrit***: ambashtha, laghupatha, patha; ***Tamil***: appata, panmushtie; ***Telegu***: adavibankatige, visaboddi.

Description

A slender, climbing, perennial herb or undershrub with striate branches and slender rhizomes. Roots light brown, to 1.3 cm in diameter, bearing transverse constrictions and longitudinal furrows; core bitter, yellowish-brown. Leaves alternate, peltate, elliptic or triangular, sometimes cordate or spherical, usually 5–7 cm long and wide, softly pubescent on both surfaces, papery; veins 7–11; petioles up to 10 cm long. Flowers minute, unisexual, greenish-yellow, crowded in the axils of the leafy bracts, male in axillary, fascicled, pilose cymes or panicles, female in 6–15-cm-long, pendulous racemes. Fruit an ovoid to subglobose drupe, red, pilose, with sub-basal persistent stylar scars, 0.4–0.5 cm across; seeds horseshoe-shaped. Flowers between July and October; fruits ripen from October to December in central Indian deciduous forests.

Distribution and habitat

Found throughout tropical and subtropical India to an altitude of approximately

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2000 m. Common in orchards, hedges, parks and gardens on moist soils; also common in lower elevation hill forests along water courses and roadsides. Found elsewhere in tropical and subtropical regions of South and Southeast Asia, East Africa and the American tropics.

Medicinal properties and uses

The bitter, acrid roots possess astringent, mild cardiotonic, diuretic, stomachic, antilithic, analgesic, antipyretic and emmenagogue properties. They are prescribed for treating cough, dyspepsia, diarrhoea, dysentery, piles, dropsy, urino-genital problems such as prolapsed uterus, cystitis, haemorrhage, menorrhagia and calcular nephritis. Pills prepared from its root, with black pepper, asafoetida and ginger and mixed with honey, are useful for indigestion and colic. The root, ground with water, is given to relieve stomach-ache, diarrhoea, and intermittent fever among the Mundas of Chota Nagpur in southern Bihar. The paste of the roots mixed with rice water is taken internally as a treatment for leprosy among the Kol and Saora tribes of Orissa. The root powder is used internally (in pill form) by inhabitants of the Gandhamardan Hills of Orissa as a remedy for arthritis. An infusion of the root is used as a health tonic among the tribal inhabitants of eastern Bihar. Crushed leaves are applied externally in the treatment of scabies and septic ulcers, and to relieve itching, burns and wounds; among the Munda in southern Bihar, the leaf paste is used to treat bone fractures. It is sometimes used as a local substitute for curare and related drugs as a muscle relaxant. The dried root is sold as a drug known commercially as *Falsa pareira brava*.

References

Asolkar *et al.* (1992), Brahmam and Saxena (1990), Chatterjee and Pakrashi (1991), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Jain *et al.* (1989), Jha and Varma (1996), Kirtikar *et al.* (1935), Varma (1997).

Cocculus hirsutus (L.) Diels

Botanical synonyms

Cocculus villosus (Lam.) DC., *Menispermum hirsutum* L., *M. villosum* L.

Common names

Bengali: huyer; ***English***: broom creeper, ink berry; ***Gujarati***: vevati, vevdi, wasan; ***Hindi***: jamtikibel, tildhara; ***Kannada***: dagadiballi, dusariballi, sugadiballi, yadaniballi; ***Konkani***: vanatikitika; ***Marathi***: paravel, vasanavela, vasanvel, wasan; ***Oriya***: musakani; ***Sanskrit***: patalagarudi, vanatiktika; ***Tamil***: kattukkodi; ***Telegu***: chipurutige, dusaraitige, katlatige; ***Urdu***: faridbutti.

Description

A scandent tomentose climber with striate branches. Roots curved, twisted, smooth, pale brown or yellowish. Leaves variable in shape: the lower leaves of the main

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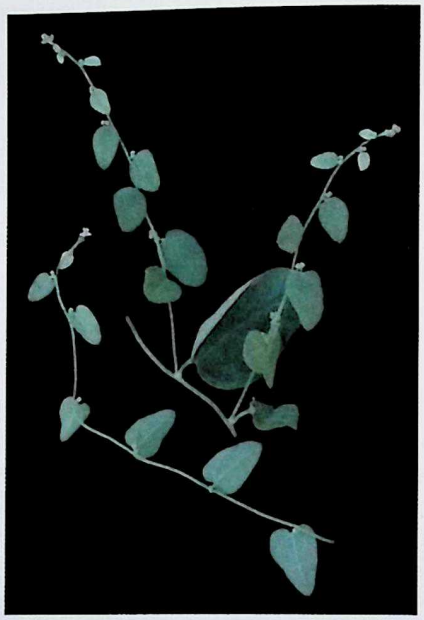
branches larger, sometimes 3–5-lobed, upper leaves smaller, narrowly to broadly ovate to elliptic; base cuneate to slightly cordate, apex obtuse to rounded and mucronate, 1.5–7 cm long and 0.7–4.7 cm wide, pubescent on both surfaces, basal nerves 5. Flowers small, unisexual, pale yellow; male with 6 stamens, borne in small axillary panicles; female with 4–6 carpels, borne 2–3 together in axillary clusters. Fruit a compressed pea-sized drupe, purplish-black. Depending on locality, flowering occurs between July and January, and fruiting mainly between December and March.



Distribution and habitat

Found throughout tropical and subtropical India, Myanmar (Burma), Sri Lanka, western Asia and tropical Africa. In central India, common in open habitats such as secondary forest vegetation around villages and cultivated fields.

Medicinal properties and uses

The root is used as a mild laxative, sudorific and antipyretic. It is widely used as a refrigerant, gentle laxative, and as an alterative for treating chronic rheumatism and venereal disease. Its decoction, in combination with *Piper longum* (*Piperaceae*) fruits in goat's milk, is considered useful in chronic rheumatism and venereal pains. In Konkan (Maharashtra) the roots are rubbed with the seeds of *Caesalpina crista* (*Fabaceae-Caesalpinioideae*) and given to children as a remedy for stomach-ache; they are also given with ginger and sugar to treat bilious dyspepsia. The leaves are reportedly given as a cooked vegetable to treat night blindness among the Sahariyas of Rajasthan; their paste is also used to relieve toothache. The mucilaginous juice of the leaves, mixed with water, is used as a refrigerant and applied externally for eczema, prurigo and impetigo; leaf-juice mixed with sugar is given as a treatment for gonorrhoea. In northeastern Karnataka the leaf extract mixed with curd (yoghurt) is used to treat spermatorrhoea.

References

Asolkar *et al.* (1992), Chatterjee and Pakrashi (1991), Chopra *et al.* (1956, 1969), Joshi (1989), Katewa and Arora (1997), Kirtikar *et al.* (1935), Seetharam *et al.* (1999).

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Tinospora sinensis (Lour.) Merrill

Botanical synonyms

Campylus sinensis Lour., *Tinospora malabarica* (Lam.) Hook. f. & Thoms., *T. tomentosa* (Colebr.) Hook. f. & Thoms.

Common names

Bengali: golancha, padma-galuncha, padma-gulancha, urti-poorti; ***Gujarati***: gulvel; ***Hindi***: amrita, giloe, gulancha, gulbel, guloh, gurch, jiwantika, nimkathia bour; ***Kannada***: amrutaballi, madhuparne, sudarsnaballi, uganiballi; ***Malayalam***: amrytu, chittamritam; ***Marathi***: gulvel; ***Oriya***: gulochi, guluchi; ***Sanskrit***: kanda-amrta, kanda-guduci, padma-guduci, pee-amrta; ***Tamil***: amudam, chindil, potchindil; ***Telegu***: tippateege.

Description

A large, woody, deciduous climber with rambling stems, bearing aerial roots from branches; bark papery, warty, pale brown or yellowish-grey. Leaves long-petioled, alternate, orbicular-cordate or ovate-cordate, apex acutely acuminate, 7–5 cm long and 4.5–12 cm wide, 5–7-nerved at base, margins entire or sinuately 3–5-lobed, densely pubescent on both sides. Flowers dioecious, green to yellowish-green with a rather disagreeable smell, in slender, drooping, axillary racemes. Fruits (drupelets) 1–3, ellipsoid, 7–9 mm long and *c.* 6 mm in diameter, turning scarlet or orange when mature; endocarp bony. Flowers during the rainy season and fruits during the winter.

Distribution and habitat

Native to South and Southeast Asia from India, Nepal and Sri Lanka to Vietnam. Occurs naturally to an altitude of approximately 1000 m in India from Assam and Bengal and throughout most of peninsular India.

Medicinal properties and uses

The mature stem of the plant has tonic and stomachic properties and is used medicinally in the same way as *Tinospora cordifolia*, a closely related, though smaller, species. Used in Ayurveda to treat fever, jaundice, burning sensations, diabetes, piles, skin ailments, respiratory disorders, neurological diseases and for improving intellect, it is a constituent of several Ayurvedic preparations for the treatment of general debility, dyspepsia, fevers and urinary diseases. The leaf juice, mixed with that of *Coleus amboinicus* (*Lamiaceae*) and honey, is used to treat gonorrhoea. The whole plant is reportedly used in Cambodia (Kampuchea) to treat piles and ulcerated wounds, and for the preparation of medicinal baths for liver disorders. In China, the fresh leaves and stems are used in treatment of chronic rheumatism.

References

Chatterjee and Pakrashi (1991), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Sivarajan and Balachandran (1994).

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Molluginaceae

Glinus lotoides L.

Botanical synonyms

Glinus dictamnoides Burm f., *G. onmioides* Burm. f., *Mollugo hirta* Thunb., *M. lotoides* (L.) Kuntze, *Pharnaceum hirtum* (Thunb.) Spreng

Common names

Bengali: duserasag; ***Gujarati***: gholo okhrad, meetho okhrad, mitho okharad; ***Hindi***: gandibudi, gandibuti; ***Kannada***: chandrakashi soppu; ***Marathi***: kotrak; ***Punjabi***: gandibuti, poprang; ***Sanskrit***: bhissata, okharadi, ushandi; ***Tamil***: sirooseroopadi.

Description

A prostrate or ascending, spreading, much-branched, stellately hairy, annual herb, usually with a long, stout taproot and spreading stems 15–45 cm long forming a loose mat. Leaves opposite or falsely whorled, broadly obovate or suborbicular, 1–2.5 cm long and 0.8–1.5 cm wide, villous on both surfaces, apex apiculate, narrowed at the base, margins finely crenulate-denticulate; petioles 6–10 mm long. Flowers pinkish, white or greenish, in axillary fascicles, 1–6 together; pedicels unequal, divaricate; calyx hairy outside, sepals 6–8 mm long, elliptic-lanceolate, acute. Fruit (capsule) ovoid, shorter than sepals, 5-valved, containing numerous minute, black, glossy, obovoid seeds with raised tubercular points and a distinct white scale at the hilum extended into a long filiform structure curving around the seed.

Distribution and habitat

Pantropical and subtropical in distribution; found throughout the plains of India. It is commonly found on sandy sites, along dry riverbeds, and on open, degraded sites.

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Medicinal properties and uses

The plant is considered to have stomachic, aperient and antiseptic properties. The juice from the crushed plant is used to relieve itches and other minor skin irritations. The dried plant is used as a purgative, to treat diarrhoea and bilious attacks, and for healing boils, wounds, and relieving pains in the limbs. Among the Rabaris in the Barda Hills of Gujarat the plant paste is used as an external application to promote healing of abscesses. The tender shoots are eaten as a cooked herb. In Ayurveda, the whole plant is used in the treatment of anorexia, gastroenteritis, cough and vomiting.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956), CSIR (1948–1992), Jadeja (1999), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

Mollugo cerviana (L.) Seringe

Botanical synonym

Pharnaceum cerviana L.

Common names

Bengali: ghimasag, ghimasak; ***Kannada***: kaage purale gida; ***Marathi***: jharasa, pada; ***Sanskrit***: parpata, parpataka; ***Tamil***: parpadagam, parppatakam; ***Telegu***: parpataka, parpatakamu.

Description

An erect slender annual herb up to 20 cm tall, with slender, cylindrical stems, branches umbellate, the nodes thickened; roots aromatic. Leaves in dense whorls of 4–8 at each node, sessile or subsessile, often glaucous; radical leaves 6–13 mm long, spathulate or linear-spathulate; cauline leaves 0.6–2 cm long and *c.* 1 mm wide, narrow-linear, apiculate, 2–8 in a whorl. Flowers numerous, on stiff filiform pedicels to 1.2 cm long, usually in groups of 3 on long filiform axillary and terminal peduncles; sepals 2.5 mm long, elliptic-oblong, obtuse, with white membranous margins. Fruit (capsule) rounded, equalling the sepals, dehiscing into 3 broadly ovate emarginate valves; seeds numerous smooth, yellowish-brown, without tubercular points. Flowers and fruits from June to September in southern India.

Distribution and habitat

Found throughout the Old World tropics. In India, it is typically found in dry and sandy habitats in the upper Gangetic plain, Rajasthan, Gujarat, southwards through peninsular India.

Medicinal properties and uses

The herb is considered stomachic, aperient and antiseptic. The flowers and tender shoots are diaphoretic and given to relieve fevers. An infusion of the plant is given to promote lochial discharge and is considered a cure for gonorrhoea. Oil in which the roots are boiled is used as an external application for gout and rheumatism. In

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Siddha, the whole plant is reportedly used to promote the flow of lochial discharges, to treat gonorrhoea, and as a febrifuge, antipyretic and astringent.

References

Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

Mollugo pentaphylla L.

Botanical synonyms

Mollugo pentaphylla var. *stricta* (L.) Hochr., *M. stricta* L., *Pharnaceum pentaphyllum* (L.) Spreng., *P. strictum* (L.) Spreng.

Common names

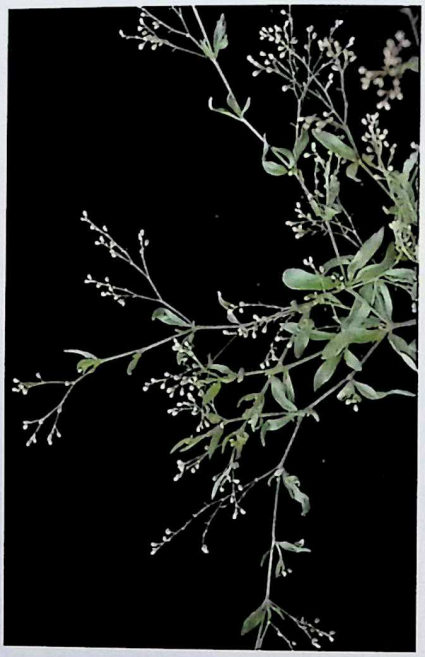
Bengali: julpapra, khet-papara; ***Malayalam***: parpadakapullu; ***Marathi***: jharasa; ***Oriya***: pitagohun; ***Tamil***: parpadakam; ***Telegu***: verrichatarasi.

Description

A slender, decumbent to erect, much-branched, usually annual herb up to 30 cm tall with an angular stem; roots fragrant. Leaves 1.3–3.7 cm long and 0.3–1.8 cm wide, in whorls of 2–9, linear-lanceolate to obovate, apex obtuse, acute or apiculate, narrowed at the base; petioles obscure. Flowers white, greenish, orange or pink in lax, corymbose, terminal cymes; peduncles and pedicels filiform; bracts lanceolate; calyx glabrous; sepals greenish-white, 1.5–2.5 mm long, broadly elliptic-oblong, obtuse. Fruit (capsule) subglobose, about as long as sepals, with thin walls; seeds numerous, dark reddish-brown, covered with raised points. Flowers and fruits from July to October.

Distribution and habitat

Common throughout India eastwards to China, Japan and the Pacific Islands. A common weed found in open, dry or moist habitats, cultivated fields, and in dry deciduous forests throughout India to 1500 m elevation.



Medicinal properties and uses

The plant is esteemed as a bitter vegetable, eaten occasionally for its stomachic, aperient and antiseptic properties. An infusion of the plant is used as an emmenagogue. In the form of a poultice, it is used to relieve sore legs. The bitter leaves are considered antiperiodic; they are warmed after smearing with oil and applied to the ear to relieve earache.

References

Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935).

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Moraceae

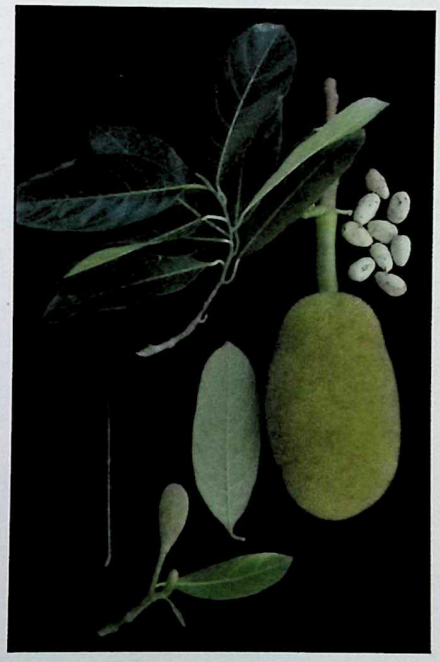
Artocarpus heterophyllus Lam.

Botanical synonym

Artocarpus integrifolia auct. mult. non L.

Common names

Bengali: kanthal, kathal; ***English***: jackfruit tree; ***Gujarati***: phanas, vanas; ***Hindi***: chakki, kanthal, kathal, kathar, panasa; ***Kannada***: alasa, halasu, hebhalasu, kuvi, panasa; ***Konkani***: ponnoss; ***Malayalam***: chakka, kandakiphala, kottachchakka, pila, pilavu, varikka; ***Marathi***: phanas; ***Oriya***: ichodopholo, kantokalo, panasa, ponoso; ***Sanskrit***: ashaya, atibrihatphala, panasa, phanasa; ***Tamil***: murasabalam, pala, pila, pila palam, pilavuverppala; ***Telegu***: panasa, verupanasa; ***Urdu***: katahal.



Description

An evergreen tree with a very dense crown, up to 15 m tall; bark often reddish-brown, smooth or slightly rough, exuding milky latex when cut. Leaves 5–25 cm long and 3.5–12 cm wide, leathery, dark shining green above, elliptic or obovate, apex obtuse to subacuminate, base cuneate, margins entire; petioles 1.3–2.5 cm long; stipules up to 2 cm long, sheathing. Flowers borne in axillary, cylindrical, oblong heads on short, leafy shoots growing from the trunk and large branches. Fruit (syncarp) irregularly cylindrical, 30–100 cm long and 25–30 cm in diameter, yellow when ripe, drying to brown with a strong, sweet odour, covered with short, hard, conical structures; 'seeds' (pericarp with a thin horny endocarp) numerous, oblong-ellipsoid, about 3 cm long, surrounded by a fleshy, edible whitish pulp.

Distribution and habitat

Probably indigenous to the evergreen forests of the Western Ghats between 450 and 1200 m elevation. Cultivated throughout tropical and subtropical India as well

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as in many other tropical countries, mainly for its sweet, edible fruits which are normally produced in great abundance, but also as a shade tree in home gardens and as an ornamental.

Medicinal properties and uses

In Ayurveda, the unripe fruit is considered acrid, astringent, carminative and tonic, and the ripe fruits laxative, cooling, fattening and useful for relieving biliousness. The seeds are diuretic, aphrodisiac and constipating. The young leaves are reportedly useful for treating certain skin diseases; their ash sometimes being used to promote healing of ulcers. The juice of the plant is applied to glandular swellings and abcesses to promote suppuration. A decoction of the roots is reportedly useful for treating diarrhoea.

References

Asolkar *et al.* (1992), Chatterjee and Pakrashi (1991), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

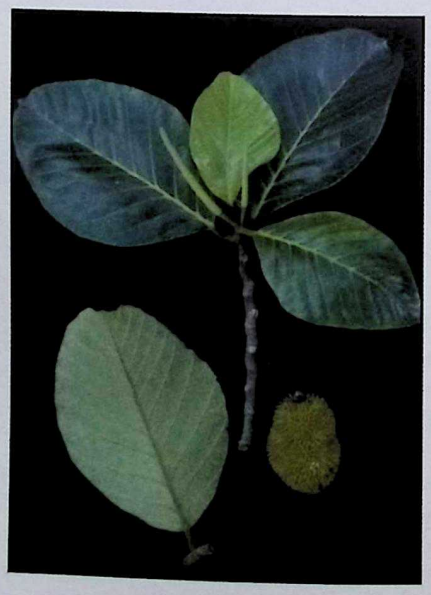
Artocarpus hirsutus Lam.

Botanical synonym

Artocarpus hirsuta Lam.

Common names

English: wild jack; ***Kannada***: halasu, hebbe-lasu, hebhalasu, hechchuva, kaduhalasu, pugguhalasu; ***Malayalam***: aini, annil-iayari, ayani; ***Marathi***: patphanas, ranphanas; ***Sanskrit***: panasah; ***Tamil***: akkini, anjali, anjili, anjuli, katu-pila, pepla, tellai-kori mara; ***Telegu***: pejata.



Description

A large, evergreen tree up to 70 m tall with grey bark, a straight, clear bole and dense foliage; young shoots, petioles, peduncles, leaf midribs and main nerves covered with

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long tawny hairs. Leaves dark green, leathery, 10–25 cm long and 5–15 cm wide, elliptic, rhomboid or ovate, apex subacute, base rounded, margins entire; main nerves about 10 pairs; petioles stout, 1.3–3 cm long; stipules nearly 2.5 cm long, lanceolate. Flowers borne in solitary or paired, narrowly cylindrical, smooth, axillary receptacles. Fruit (syncarp) about 5 cm long and 4 cm in diameter, short-cylindrical to ellipsoid, yellow to orange when ripe; 'seeds' (pericarp with a thin horny endocarp) ovoid, 1.3–2 cm long. Flowers and fruits between January and May.

Distribution and habitat

Found in moist deciduous and evergreen forests of the Western Ghats from North Kanara (Karnataka) southwards to Travancore (Kerala), up to an altitude of 1200 m. It is often planted in the moist regions of southern India.

Medicinal properties and uses

The dry leaves and juice, together with zeodary (from *Curcuma zeodaria*: *Zingiberaceae*) and camphor (from *Cinnamomum camphor*: *Lauraceae*) are used as an external application to relieve inflammatory swellings of lymph glands and swollen testicles.

References

Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935).

Artocarpus lacucha Buch.-Ham.

Botanical synonym

Artocarpus lakoocha Roxb.

Common names

Bengali: dahu, dehua, dephal, dheu; ***English***: monkey jack; ***Gujarati***: lakucha; ***Hindi***: barhal, dahu, dheu, lakuch; ***Kannada***: esuluhuli, lakucha, otehuli, vatehuli, wonta; ***Konkani***: otambi; ***Malayalam***: chimpa, kattupilavu, lakucham, pulinjakka, thitti-pilavu; ***Marathi***: badhar, vatara, wotomba; ***Oriya***: jeuto; ***Sanskrit***: lakuca, lakucha, lakudi; ***Tamil***: hagusam, irappala, ottipilu; ***Telegu***: dhum, kammaregu, nakkarenu, tium; ***Urdu***: barhal.

Description

A large, deciduous tree up to 20 m tall, with a large, spreading crown and clear straight bole; bark rough, grey, exfoliating in small woody flakes, reddish inside, softly fibrous with faint streaks of white latex; young shoots densely clothed with a soft grey, tawny or rusty tomentum. Leaves leathery, 20–30 cm long and 5–15 cm wide, oblong, elliptic or subovate, apex obtuse, cuspidate,

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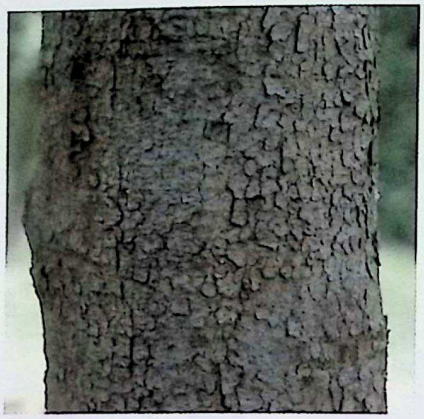

base broadly cuneate, with 6–12 pairs of veins; petioles 1.3–2.5 cm long. Flowers borne in axillary, globose, shortly pedunculate heads; bracteoles peltate. Fruit (syncarp) subglobose, shallowly lobed, 5–7.5 cm in diameter, smooth, velvety, yellow when ripe, drying to brown; 'seeds' (pericarp with a thin horny endocarp) 1 cm long and 0.6 cm wide. Flowering and fruiting periods vary with local climate, but in most parts of India occur mainly from January to May, and occasionally from October to February.

Distribution and habitat

Found in evergreen, semi-evergreen and moist deciduous forests in northern India to an altitude of 1800 m from Kumaon to Assam, in Orissa, Madhya Pradesh and in the hill forests of southern India from Konkan (Maharashtra) southwards to Kerala and Tamilnadu. In deciduous forests it is typically found on deep, well-drained soils along streams and in moist ravines. Also found in Myanmar (Burma), Sri Lanka, the Andaman Islands and peninsular Malaysia. Cultivated throughout India as an ornamental and shade tree.

Medicinal properties and uses

The powdered bark is applied to sores to draw out purulent matter; a paste of the bark or its infusion is applied to heal cracked skin, small pimples and boils. The latex obtained from the cut bark is used to treat toothache and dental caries among the tribal inhabitants of eastern Bihar. The seeds are purgative. The ripe fruits are widely used in chutneys and, when dried, in curries as a substitute for tamarind paste. The bark is reportedly chewed in Assam as a substitute for betel-nuts (from *Areca catechu*: *Arecaceae*).

References

Asolkar *et al.* (1992), Chatterjee and Pakrashi (1991), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935), Kumar and Goel (1998).

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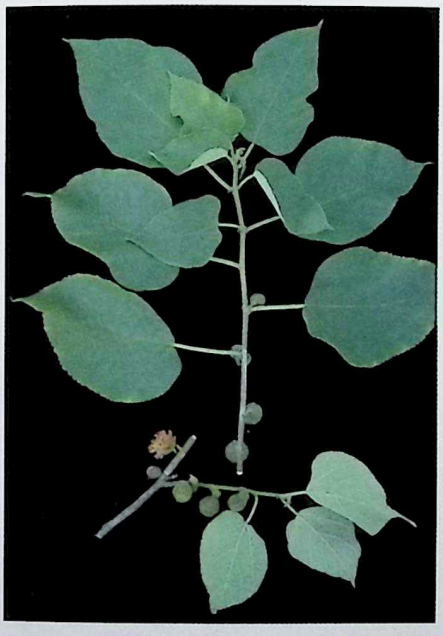
Broussonetia papyrifera L'Her. ex Vent.

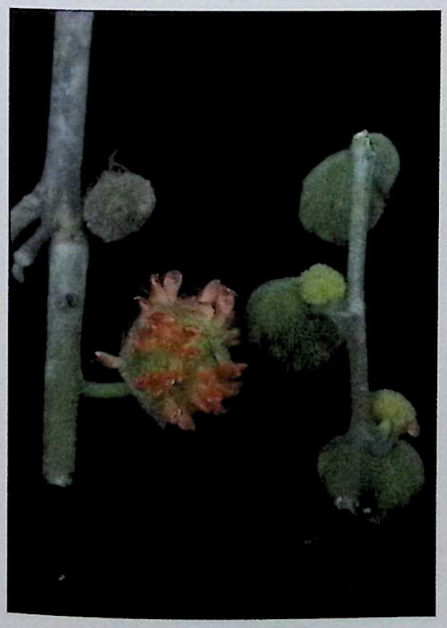
Common names

English: paper mulberry, tapa-cloth tree; ***Hindi***: jangali toot; ***Kannada***: kaagada-uppuraeralae.

Description

A medium-sized tree up to 21 m tall, with light grey, smooth, shallowly fissured bark. Leaves variable, 8–20 cm long, obliquely ovate or oblong, pale beneath, margins entire or finely serrate, sometimes lobed, apex acuminate; petioles long. Flowers unisexual; male flowers borne in cylindrical catkins, female, reddish-orange in globose heads. Fruit (syncarp) fleshy, red when mature, shining.





Distribution and habitat

Native to the Indo-Malaysian region, China, Japan and Polynesia. In India it is found, often planted, from Punjab to Arunachel Pradesh and Meghalaya, in West Bengal and in peninsular India up to

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1000 m elevation. It grows best on sites receiving more than 125 cm annual rainfall with well-drained, sandy-loam soils.

Medicinal properties and uses

The seeds are considered tonic and diuretic. The leaves are reportedly used to relieve indigestion and as a diaphoretic. An extract of the bark is recommended for treating eczema. The inner bark yields a strong, lustrous fibre that has been used traditionally in China and Japan for paper-making.

References

Asolkar *et al.* (1992), CSIR (1948–1992).

Ficus arnottiana (Miq.) Miq.

Botanical synonyms

Ficus arnottiana var. *courtellensis* (Miq.) Miq., *F. emodi* (Miq.) Miq., *Pogontrophe emodi* Miq., *Urostigma arnottiana* Miq., *U. caulobotryum* Miq., *U. coureallense* Miq.

Common names

Hindi: paraspipal; ***Kannada***: bettadarali, kaadu ashwatha, kadarase, kadasvattha, kallarase; ***Malayalam***: amakanniyam, amakanniyan, aswathom, kallarayal; ***Oriya***: plokhyo; ***Sanskrit***: plaksha; ***Tamil***: kagoli, kal-arasu, kallarasu, kodiyarasu; ***Telegu***: kallaravi, kondaravi.

Description

A small tree or shrub with smooth grey bark. Leaves glabrous, broadly ovate, 8–20 cm long and 5–15 cm wide, apex shortly caudate-acuminate, base usually cordate, with 5–7 nerves arising from the base and 5–7 pairs of lateral nerves, margins entire; petioles 5–15 cm long; stipules ovate-lanceolate, reddish-brown when dried, deciduous. Receptacles (figs) depressed-globose, smooth, purple with greenish dots when ripe, 4–10 mm in diameter, borne in pairs or dense clusters in the axils of fallen leaves or on tubercles of stem; peduncle 0–5 mm long; basal bracts 3, brown, membranous. Flowers and fruits between December and September in Karnataka, and mainly between March and June in central India.

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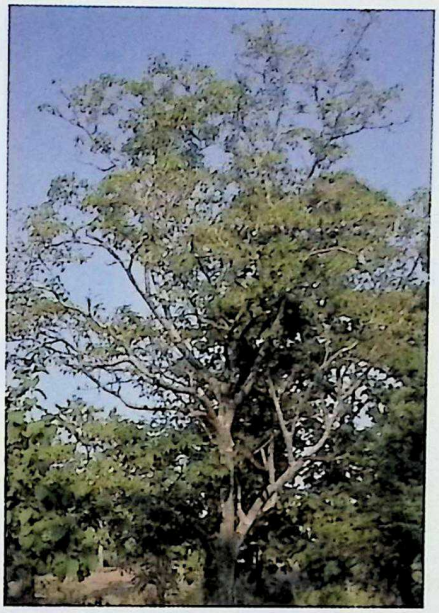
Distribution and habitat

Common in dry and moist deciduous forests, open grassy slopes and in rocky ravines of Rajasthan, Madhya Pradesh and Bihar, in the western and southern regions of peninsular India to an elevation of about 1400 m; also found in Sri Lanka. It is often epiphytic on other trees.



Medicinal properties and uses

The leaves and bark are reportedly used to treat skin diseases.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956), Kirtikar *et al.* (1935).

Ficus benghalensis L.

Botanical synonyms

Ficus banyana Oken, *F. cotonaefolia* Vahl, *F. indica* L., *Urostigma benghalensis* (L.) Gasp.

Common names

Bengali: bar, bot; ***English***: banyan tree; ***Gujarati***: vad, vadlo, vor; ***Hindi***: bar, bargat, ber, bhargad, bor; ***Kannada***: al, ala, alada mara, vata; ***Konkani***: vad, vhad; ***Malayalam***: ala, nyagrodham, peral, peralu, vatam; ***Marathi***: vada, wad, war; ***Oriya***: baro, boro, boru, boto; ***Punjabi***: bargad, bera, bor; ***Sanskrit***: bahupada, nyagrodhah, vata, vatah; ***Tamil***: al, ala, alam, peral, pudavam; ***Telegu***: marri, peddamarri, vati; ***Urdu***: bargoda.

Description

A very large tree up to 30 m tall, evergreen except in very dry localities, with spreading branches and numerous aerial roots that often develop into accessory trunks helping the tree to spread laterally a considerable distance from the original stem; bark smooth, light grey; twigs light brownish-ochre; branchlets, stipules, petioles, underside of leaves and figs white velvety, slowly turning glabrescent. Leaves spirally arranged on branchlets, up to 10–30 cm long and 7–20 cm wide, coriaceous, elliptic to ovate, apex obtuse, base rounded, with 5–7 basal nerves; petioles 2.5–5 cm long; stipules stout. Fruits (figs) sessile, axillary in pairs, 1.3–1.9 cm in diameter, globose, silky-pubescent, scarlet or brick red when ripe. Flowers during the summer and fruits during the rainy season.

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Distribution and habitat

Found throughout the moist and dry deciduous forest regions and plains of South Asia to an elevation of about 1200 m, from the sub-Himalayan hills in the north through peninsular India and in Sri Lanka. It is widely planted throughout the country and elsewhere in tropical Asia in gardens and along roads for shade.

Medicinal properties and uses

The stem bark, root bark, aerial roots, leaves, vegetative buds and milky exudate are all used in Ayurvedic medicine and in the preparation of a number of important compound formulations. The crushed seeds and the milky juice exuded from the cut stems, branches and twigs are applied externally to relieve pains, sores, ulcers and bruises, and as an anodyne for treating rheumatism and lumbago. It is considered a valuable application for relieving and healing cracked and burning soles, and is also used as a remedy for toothache. The crushed dried fruits are taken with honey as a treatment for spermatorrhoea among the tribal inhabitants of central Orissa; in this region the latex of the plant is taken with banana in the treatment of gonorrhoea. The seeds are considered cooling and tonic. A paste of the leaves, or the heated leaves, is applied as a poultice to promote healing of abscesses. An extract of the leaves is used as an aphrodisiac by men and women in northeastern Karnataka. The bark is astringent; its infusion is considered a powerful tonic and useful for treating diabetes, dysentery and diarrhoea, leucorrhoea, menorrhagia and nervous disorders. An infusion of the young buds is considered useful for diarrhoea and dysentery. The young tips of the aerial (hanging) roots are given as an anti-emetic; crushed and boiled in cow's milk, the hot filtered solution is taken to relieve piles among the tribal inhabitants of Sundargarh District in Orissa. The aerial root tips are also applied as a paste to relieve bleeding piles and to promote healing of syphilitic lesions among the Kondhs of southwestern Orissa, and mixed with egg as an external application to promote healing of bone fractures among the Gonds of Uttar Pradesh. In southern Orissa, the juice of the aerial roots is given to children suffering from dysentery.

References

Asolkar *et al.* (1992), Chatterjee and Pakrashi (1991), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Girach (1992), Kirtikar *et al.* (1935), Mohanty *et al.* (1996), Mukherjee and Namhata (1990), Sahoo and Mudgal (1995), Seetharam *et al.* (1999), Singh and Prakash (1994), Sivarajan and Balachandran (1994), Yoganarasimhan (1996).

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Ficus benjamina L.

Botanical synonyms

Ficus nitida Thunb., *F. pyrifolia* Salisb., *F. retusa* L. var. *nitida* (Thunb.) Miq.

Common names

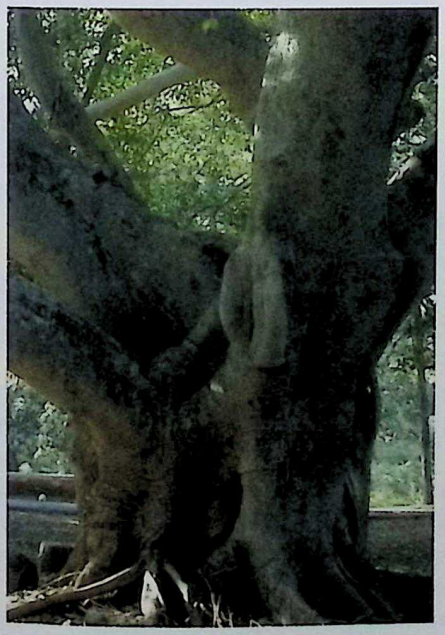
Bengali: kamrup, pakur; ***English***: golden fig, Java fig; ***Hindi***: kamrup; ***Kannada***: Java athi; ***Konkani***: arekgol, dhavidek goli; ***Malayalam***: jili, vellal; ***Marathi***: nandruk; ***Oriya***: jodi; ***Tamil***: putrajuvi; ***Telegu***: kondagolugu, kondajuvvi, putrajuvvi.

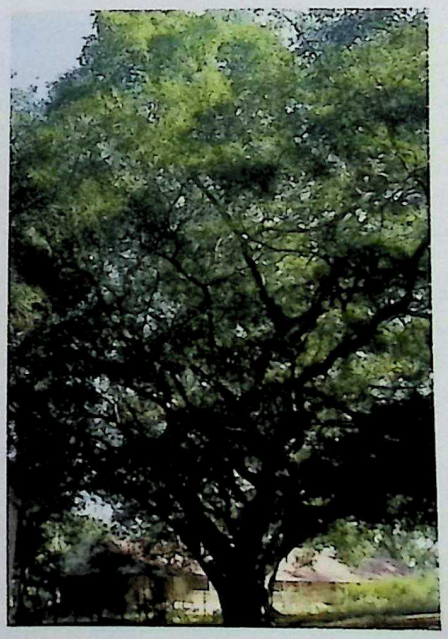
Description

A large evergreen tree with a dense, divaricate crown and pendulous branches; aerial roots few or absent; bark smooth, grey. Leaves glabrous, ovate to elliptically ovate, generally 5–9 cm long and 1.5–6 cm wide, margins entire, apex bluntly acuminate, base obtuse to cuneate, nerves thin, parallel and uniting near the margins; petioles slender, 1–1.7 cm long; stipules *c.* 1.3 cm long, ovate-lanceolate, pubescent outside. Receptacles (figs) sessile, solitary or paired in leaf axils, 0.8–2 cm in diameter, globular and narrowed at base, dark red when ripe, hispid, with 3 short, broad bracts.

Distribution and habitat

Native to tropical Asia from India, Nepal and Bangladesh to Myanmar (Burma), Indochina,





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southern China and Thailand, throughout the Malesian region east to the Solomon Islands and south to northern Australia. In India it is found in the foothills of the eastern Himalayas to the northeastern states and southwards to Chota Nagpur (southern Bihar and northeastern Madhya Pradesh), coastal districts of Orissa and northern Andhra Pradesh, and in Kerala. It is commonly planted as a roadside and garden tree in many parts of India, and is grown as a house plant in temperate regions.

Medicinal properties and uses

In Kerala a decoction of the leaves, mixed with oil, is applied to promote healing of ulcers. The Mundas of Chota Nagpur use the milky juice from the plant to clear whitening of the cornea.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

Ficus hispida L. f.

Botanical synonyms

Ficus daemona Koen. ex Vahl, *F. daemonum* Koen., *F. oppositifolia* Roxb.

Common names

Bengali: dumoor, jogdumur, kakdumur, kakodumar; ***Gujarati***: dhedaumaro, dhedumeru, jangliangir; ***Hindi***: daduri, dagurin, gobla, kagsha, katguilaria, koneadumbar; ***Kannada***: adavi atti, kaadu aththi, kadatthi, medi, olapatha; ***Malayalam***: erumanakku, parakam, peyatti; ***Marathi***: bhokada, bokria, kalaumber, kharoti; ***Oriya***: bhaidimiri, korotosano, sahadaboro; ***Punjabi***: daduri, degar, rumbal; ***Sanskrit***: kakadumbura, kakodumbara; ***Tamil***: chona-atthi,ottannalam, peyatti, pollaparakam, sonatti; ***Telegu***: bemmadu, boddamari, bommamedi, botamamidi, brammadi, vettiyati.

Description

A shrub or small tree up to 15 m tall with smooth grey bark; latex white; twigs hollow, all young parts more or less hispid-pubescent with short white to pale brown hairs. Leaves opposite or spirally arranged, thin, 7–35 cm long and 2.5–16 cm wide (larger in saplings), scabrid above, clothed with short, stiff hairs beneath, obovate, elliptic-oblong to ovate, margins entire or dentate, apex apiculate or shortly acuminate, base truncate-cordate, 3–5-nerved with 4–7 pairs of lateral nerves; petioles 1.3–2.5 cm long; stipules 1.1–2.5 cm long, pubescent, 2 per leaf. Receptacles (figs) obovoid or turbinate, 1.3–2.5 cm in diameter, greenish-yellow when ripe, hispid, borne in pairs or clusters on leafless, often trailing, branchlets. Flowers and fruits throughout most of the year, depending on locality, but mainly between January and April in central India.

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Distribution and habitat

Occurs naturally in tropical Asia from Pakistan, India and Sri Lanka eastwards through Southeast Asia to tropical Australia. Commonly found in moist, shady habitats, along streams, and in ravines in secondary deciduous and evergreen forests throughout the outer Himalayas from Punjab eastwards to Bengal, and southwards to Tamilnadu and Kerala up to an altitude of *c.* 1250 m; also found in the Andaman Islands.

Medicinal properties and uses

The fruit, seeds and bark possess emetic properties. The immature fruits are considered tonic and lactagogue; they are sometimes eaten in curries. The dried, powdered fruits are boiled in water and applied as a poultice to disperse swollen, inflamed lymph glands. The fruit juice mixed with honey is considered antihaemorrhagic. The leaves are used as a poultice to promote healing of boils. The bark is considered to be antidiarrhoeal and, taken in small doses, is used as a tonic. In southern Orissa, the latex from the cut stem bark is taken orally for treatment of dysentery and diarrhoea and, in northeastern Orissa, to relieve headache.

References

Asolkar *et al.* (1992), Chatterjee and Pakrashi (1991), Chopra *et al.* (1956), CSIR (1948–1992), Girach *et al.* (1997), Kirtikar *et al.* (1935), Mohanty *et al.* (1996), Yoganarasimhan (1996).

Ficus lacor Buch.-Ham.

Botanical synonyms

Ficus infectoria Roxb., *F. lucescens* Bl.

Common names

Bengali: pakar, pakur; ***Gujarati***: pepri; ***Hindi***: kahimal, kaim, keol, pakri, pilkhan; ***Kannada***: basari, juvvi, kabbasari, kari-basari; ***Konkani***: killah; ***Malayalam***: bakri, chakkila, chela, cherla, pepar; ***Marathi***: bassari, dhedumbara, gandhaumbara; ***Oriya***: pakodo, rushorchona; ***Punjabi***: pakhar, pilkhan, trimbal; ***Sanskrit***: plaksa, plaksha; ***Tamil***: jovi, kallal, kurugatti, kurugu, malai-ichchi, suvi; ***Telegu***: badi-juvvi, jati, juvi; ***Urdu***: pakharia.

Description

A large, spreading, deciduous tree with smooth, scaly grey bark, epiphytic in its early stages, sometimes with aerial roots;

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all parts glabrous. Leaves thin, 9–13 cm long and 5–6.3 cm wide, ovate or ovate-oblong, margins entire or subundulate, apex shortly acuminate, base usually rounded, 3-nerved, lateral nerves not prominent; petioles 3.8–5.7 cm long, sometimes jointed with the blade; stipules about 1.3 cm long, acute, pubescent. Receptacles (figs) subglobose, 0.5 cm in diameter, white or pinkish and red-dotted when ripe, borne in axillary pairs. Flowers at the end of the rainy season and fruits during the winter months. The tree is variable and three varieties are recognized: var. *infectoria*, var. *lambertiana* and var. *wightiana*.

Distribution and habitat

Found throughout the plains and lower hills of India, Sri Lanka and Malaysia, commonly planted as an avenue tree and ornamental, and in south India as a shade tree for coffee, up to *c.* 2150 m elevation.

Medicinal properties and uses

All parts of the plant are considered acrid, pungent and cooling in Ayurveda, and useful for treating diseases of the blood and ulcers, burning sensations, inflammations and biliousness; mixed with honey it is used as an external application to treat vaginal diseases. In Unani, the seeds are used to treat bronchitis, biliousness, scabies, boils and inflammations. A mixture of the bark of this and three other species of *Ficus* and of *Azadirachta indica* (neem: *Meliaceae*) is known as *Panchavalkala* ('the five barks'), used in the form of a decoction as a gargle, as a wash to promote the healing of ulcers, and as an injection in the treatment of leucorrhoea. The fruits are edible and the young shoots are eaten in curries.

References

Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935).

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Ficus racemosa L.

Botanical synonyms

Ficus glomerata Roxb., *F. semicostata* F.M. Bailey, *F. vesca* F. Muell. ex Miq.

Common names

Bengali: dumar, jagyadumbar, yajnadumbar; ***English***: cluster fig; ***Gujarati***: gular, umar, umbar; ***Hindi***: dimere, gular, umar, tue; ***Kannada***: atti, rumadi; ***Konkani***: rumbod; ***Malayalam***: atthi, atthi-al, atti, attimara, jantuphalam, udumbaram; ***Marathi***: atti, gular, umbar, umbara; ***Oriya***: dimiri, jdimri, ognondumburo, udumboro; ***Punjabi***: dadhuri, kumbal, rumbal; ***Sanskrit***: udumbara, udumbarah; ***Tamil***: atthi, atti, attimaram, tumbaram, udumbaram; ***Telegu***: atti, bodda, paidi, udumbaramu; ***Urdu***: gular.

Description

A medium-sized to large evergreen or occasionally deciduous tree up to 18 m tall, often with an irregular, shabby crown. Bark smooth, pinkish-brown to reddish-grey, coarsely flaky on older trees; latex copious, cream-buff in colour. Young shoots and figs finely white-hairy, turning glabrous. Leaves alternate, glabrous, 6–19 cm long and 3.2–8.5 cm wide, ovate-oblong or elliptic-lanceolate, margins entire, tapering to a bluntly pointed apex, base acute or rounded, 3-nerved; petioles 1.3–3.8 cm long; stipules 2 cm long, pubescent. Receptacles (figs) subglobose, dense tomentose, 1.5–4 cm across, dull reddish when ripe, borne in large clusters on short, leafless, warty branches arising from the trunk and older branches. In central Indian deciduous forests, flowers and fruits in May and June; trees often leafless between November–December and January–February.

Distribution and habitat

Occurs naturally from Ethiopia to Pakistan, India, Sri Lanka, Myanmar (Burma) and eastwards through Southeast Asia to New Guinea and northern Australia. Found throughout most of India to an elevation of about 2000 m in evergreen forests and along the banks of streams or in moist ravines in deciduous forests. Also found in Sri Lanka, Pakistan, southern China to New Guinea and northern Queensland, Australia. Often cultivated for its edible fruits.

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Medicinal properties and uses

The milky juice (latex) from the plant is reportedly used for treating piles and diarrhoea, and externally for healing ulcers. In Rajasthan it is reportedly used to promote healing of chapped and cracked skin during the winter, and as an external application to the testes for treating hydrocele in northeastern Karnataka. The fruits are considered astringent, stomachic and carminative, and are given in the treatment of menorrhagia and haemoptysis. The root sap is used for treating diabetes; both the root and fruit are credited with hypoglycaemic activity. The root juice is reportedly useful for treating dysentery. The dried, powdered leaves are mixed with honey and given to relieve bilious affections. The leaf juice together with boiled rice and *jaggery* is given in the treatment of paralysis among the Gonds of Uttar Pradesh. The stem bark is astringent; its decoction is used as a wash to clean wounds, and its infusion is much used in southern India for treating menorrhagia, leucorrhoea, gonorrhoea, urinary diseases, haemorrhage and skin diseases. In the form of a paste the bark is used to relieve dysentery and vomiting among the Sahariyas in northwestern Madhya Pradesh. The tribal inhabitants of Prakasam District in southern Andhra Pradesh use a decoction of the stem bark to treat diarrhoea and dysentery; in this region the latex is applied inside the vagina as a treatment for gonorrhoea. An ointment prepared from the ashes of the stem bark in clarified butter (*ghee*) is applied to promote healing of foot sores, pimples, boils and carbuncles among the Sahariyas of Rajasthan. Both the fruits and bark are used extensively in Ayurvedic and Unani medicine. In Siddha the bark, fruits and latex are used to treat constipation, anaemia and dysentery.

References

Asolkar *et al.* (1992), Chatterjee and Pakrashi (1991), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Joshi (1989), Kirtikar *et al.* (1935), Kumar and Jain (1998), Seetharam *et al.* (1999), Sikarwar and Kaushik (1992), Singh and Prakash (1994), Sivarajan and Balachandran (1994), Vijaya Kumar and Pullaiah (1998), Yoganarasimhan (1996).

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Ficus religiosa L.

Botanical synonym

Urostigma religiosum (L.) Gasparrini

Common names

Bengali: ashathwa, asvattha; ***English***: peepal, sacred bo tree, sacred fig; ***Gujarati***: jari, pipro, pipul; ***Hindi***: pipal, pipli; ***Kannada***: arali, ashwatha; ***Konkani***: pimpoli; ***Malayalam***: arachu, arasu, arayal, arei-al, ashvatham; ***Marathi***: ashvatha, pimpala; ***Oriya***: jori, oshwottho, pippolo, usto; ***Punjabi***: bhor, pipal; ***Sanskrit***: asvattha, asvatthah, pippala; ***Tamil***: arasa, arasu, aswattham; ***Telegu***: ashvatthamu, bodhi, ragi, rai, ravi; ***Urdu***: pipal.

Description

A large deciduous tree without aerial roots from the branches, epiphytic when young, with spreading branches and grey bark. Leaves spirally arranged, broadly elliptic-obovate or suborbicular, 7–26 cm long and 4–16 cm wide, margins undulate, apex cuspidate with the tip 2.5–9 cm long, base rounded, truncate; nerves 3–7 from the base with 6–8 pairs of lateral nerves; petioles 7.5–10 cm long; stipules minute, ovate, acute. Receptacles (figs) smooth, globose, up to 1.5 cm in diameter, sessile in axillary pairs, black or purple when ripe. In central India, flowers and fruits from October to December and again from February to April; trees usually leafless between February–March and April–May.

Distribution and habitat

Its native range extending from Pakistan to Vietnam, it is found wild in sub-Himalayan forests from Rawalpindi (Pakistan) eastwards to West Bengal and Bangladesh, and in central India. The tree is held sacred by Hindus and Buddhists and is cultivated throughout most of India, usually near temples and as an avenue or roadside tree.

Medicinal properties and uses

An infusion of the astringent bark is used internally to treat scabies, and as an external application for other skin diseases and to promote healing of ulcers. In Ayurveda the bark is considered alterative, cooling, haemostatic and laxative; it is used in the treatment of diabetes, diarrhoea, leucorrhoea, menorrhagia, nervous disorders and vaginal diseases. A paste of the powdered bark is used as an absorbent in treating inflammatory ulcers. The young bark is use-

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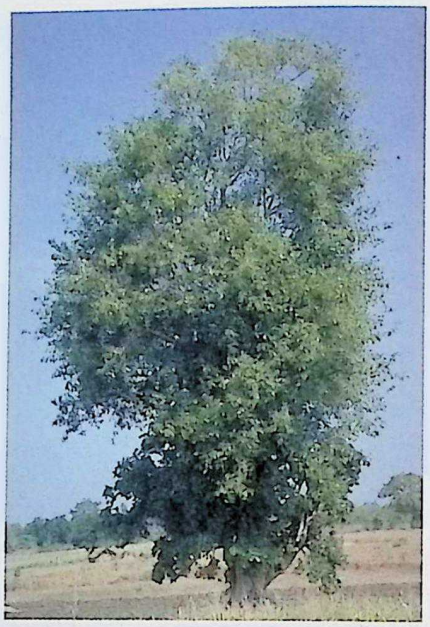
ful for healing bone fractures. The leaves and tender shoots are used as a purgative and also for treating skin diseases. The fruit and seeds are laxative and seeds are also considered cooling and alterative; among tribal women of Surguja District in north-eastern Madhya Pradesh, the fruits are eaten with red sugar-candy to treat menstrual disorders. In Ayurveda, the root is considered useful for treating gout, and the root bark for stomatitis, for cleaning ulcers and as an astringent for treating leucorrhoea.



References

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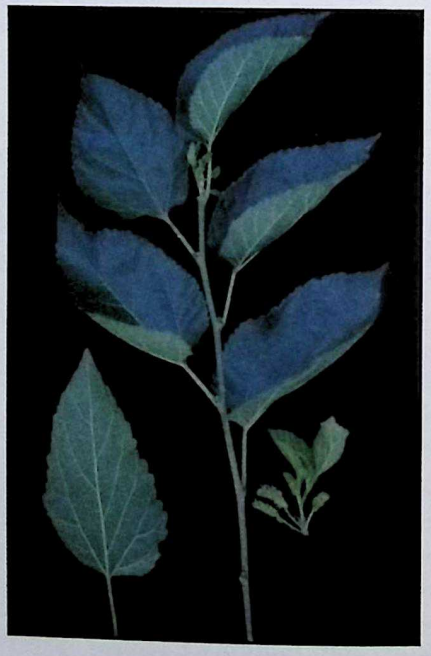
Morus alba L.

Botanical synonyms

Morus macrophylla Moretti, *M. morettiana* Jacq., *M. nervosa* Deles. ex Spach.

Common names

Bengali: tut; ***English***: mulberry, white mulberry; ***Gujarati***: shetur; ***Hindi***: chinni, tut, tutri; ***Kannada***: bili uppu nerale, hipnerle; ***Marathi***: tut, ambat; ***Oriya***: tuto, tuticoli; ***Punjabi***: tut, tutri; ***Sanskrit***: toola, tula; ***Tamil***: kambli chedi, mudukette, pattupuchi; ***Telegu***: reshme chettu, pippalipandu chettu.



Description

A usually monoecious shrub or a medium-sized tree with a cylindrical stem and rough, brown, vertically fissured bark. Leaves very variable in size and shape, usually 5–7.5 cm long, often deeply lobed, margins serrate or crenate-serrate, apex acute or shortly acuminate, base cordate or truncate; basal nerves 3, lateral nerves forked near the margins. Flowers inconspicuous, greenish: male spikes (catkins) broadly cylindrical or ovoid, female spikes ovoid, stalked. Fruit (syncarp) consists of many drupes enclosed in a fleshy perianth, ovoid or subglobose, up to 5 cm long, white to pinkish white, purple or black when ripe.

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Distribution and habitat

Native to Pakistan, India and Nepal, eastwards to Myanmar (Burma), Indochina, China and Japan. It is extensively cultivated throughout the plains of India and Pakistan, and in the Himalayan hills up to 3300 m elevation for its foliage, which is used as a food source for silkworms; also cultivated in Europe and throughout most of Asia, occasionally naturalized.

Medicinal properties and uses

The leaves are considered diaphoretic and emollient; their decoction is used as a gargle to relieve throat inflammations. The fruit is cooling and laxative, and used to treat sore throat, dyspepsia and melancholia; the sweet, deep red juice of either the red or white fruits, is used as a pleasant-tasting refrigerant during fevers. The root reportedly possesses anthelmintic and astringent properties. The bark is used as a vermifuge and purgative.

References

Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

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Moringaceae

Moringa oleifera Lam.

Botanical synonym

Moringa pterygosperma Gaertn.

Common names

Bengali: sajina, sajna, sujana; ***English***: drumstick tree, horseradish tree, oil of ben tree; ***Gujarati***: midhosaragavo, saragavo, segto, seyla; ***Hindi***: mungna, sahjan, saijna, sanjna, shajna, soanjana, soajna, sohajna; ***Kannada***: guggala, mochaka, nugge, nuggi; ***Konkani***: maissang, moring, moxing; ***Malayalam***: moringa, murinna, sigru; ***Marathi***: achajhada, shevgi; ***Oriya***: munigha, munika, sojina, sojoba; ***Punjabi***: sanjna, senjna, soanjna; ***Sanskrit***: shobhanjana, sigru, sigruh, sobhanjana; ***Tamil***: moringa, murungai; ***Telegu***: mulaga, munaga, munga, sajana, tellamunaga; ***Urdu***: sahajna.

Description

A small or medium-sized tree up to 10 m tall, with thick, soft, corky, deeply fissured bark and tomentose twigs; roots pungent. Leaves usually tripinnate, to 45 cm long; pinnae and pinnules opposite, deciduous; leaflets 1.2–2 cm long and 0.6–1 cm wide, the lateral elliptic, the terminal obovate. Flowers white, fragrant, in large panicles. Fruits (pods) pendulous, green, 22–50 cm or more in length, triangular, 9-ribbed; seeds trigonous, the wings angled. Flowers and fruits once or twice each year, depending on locality; in central India, where trees remain leafless between December–January and January–February, flowering occurs mainly between November and March, and fruiting from February to June

Distribution and habitat

Indigenous to northwestern India and Pakistan and plentiful on recent alluvial land or near riverbeds and streams.

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Cultivated throughout India primarily for its abundant, edible pods; it thrives in the tropical climate of southern India.

Medicinal properties and uses

Nearly all parts of the tree are used in traditional Indian medicine, the roots, leaves and seeds being of particular importance in Ayurveda. The root and root bark are considered carminative, stomachic and abortifacient; they are applied externally to cure inflammatory swellings. An infusion of the roots is used in Ayurveda to treat asthma, gout, rheumatism and inflammation; the fresh roots are used as a stimulant to treat paralytic affections, epilepsy, intermittent fever, and as a cardiac and circulatory tonic. As a rubifacient, they are used externally in the treatment of palsy and chronic rheumatism. In the form of a compound spirit, they are used to treat fainting, giddiness, nervous debility, spasmodic affections of the bowels, hysteria and flatulence. The leaves are rich in vitamins A and C and are considered useful in the treatment of scurvy and catarrhal affections; they are also used as a galactagogue. The crushed leaves are taken in the form of a tablet to relieve stomach pain during menstruation by women in northeastern Karnataka. A paste of the leaves is applied externally to promote healing of wounds. The juice extracted from the leaves has strong antibacterial and antimalarial properties. Among the tribal inhabitants of Sundargarh, the crushed bark boiled in mustard oil is used as a balm to relieve acute traumatic pain. The flowers are used as a tonic, aphrodisiac and diuretic. Both the flowers and roots contain pterygospermin, an antibiotic that is highly effective in the treatment of cholera. The fruit (pod) is used to treat diseases of the liver and spleen, articular pains, tetanus and paraly-

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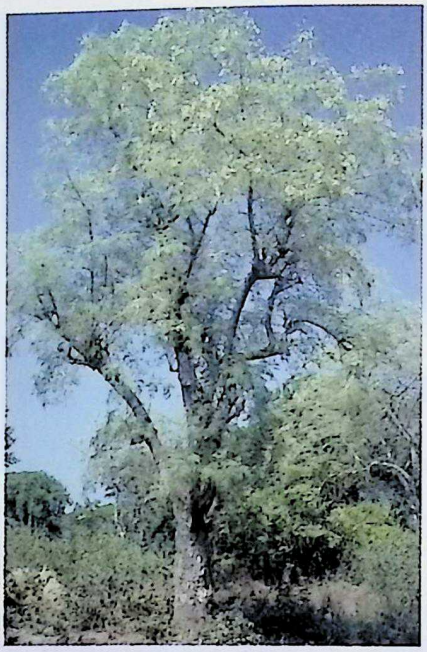
sis. The seeds are considered antipyretic, acrid and bitter, and are sometimes used to treat venereal affections. The seed oil, known commercially as *ben oil*, is applied externally to treat rheumatism and gout. The tender pods are highly valued for their taste (similar to asparagus) and nutritional value, and are eaten as a cooked vegetable or as a pickle. The flowers and tender leaves are also eaten fried or as a pot-herb. The seeds are eaten after frying, and reportedly taste like peanuts. The roots are used as a pungent-tasting condiment or garnish in the same way as those of true horseradish (*Armoracia rusticana*: *Brassicaceae*); the root bark, rich in alkaloids (notably moringine, a toxic substance allied to ephedrine), must be completely removed before it is used for this purpose.



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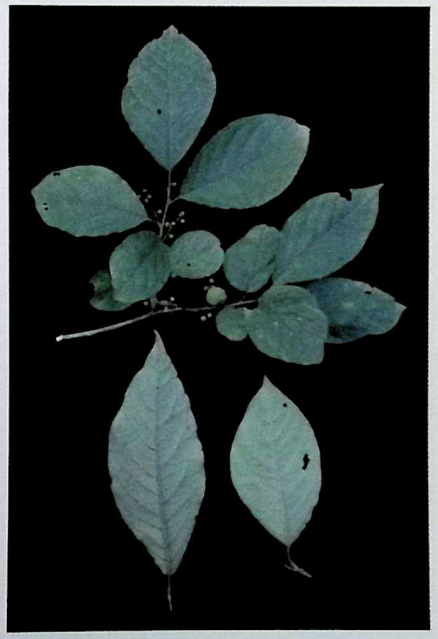
Myrsinaceae

Embelia tsjeriam-cottam A. DC.



Botanical synonyms

Embelia acutipetalum (Lam. ex Hassk.) S.M. & M.R. Almeida, *E. basaal* (Roem. & Schult.) A. DC., *E. robusta* Roxb.

Common names

Hindi: baberang, baibrang, bayabirang, bhingi; ***Kannada***: amti, joladhanna, vaivaling; ***Konkani***: wayuwalingiballi; ***Malayalam***: cheriyannattam; ***Marathi***: ambati, ambuti, kokla, vaivarang, vavading; ***Oriya***: baibedanga, bayibidongo, bidongo, krymighno, nuninunika; ***Sanskrit***: vidanga, vidangah.

Description

A rambling shrub or small tree with glabrous or rusty-pubescent branchlets subtended by imbricating scales. Leaves elliptic-ovate, acute, subentire, often rusty-pubescent beneath, to 10 cm long and 6.5 cm wide, gland-dotted. Flowers small, yellowish-white, borne in racemes or panicles arising from young branchlets; petals 4–5, white, densely hairy inside. Fruits globose, *c.* 3–4 mm in diameter, apiculate with the style, longitudinally striated and red when ripe.

Distribution and habitat

Distributed throughout most of India in semi-evergreen and deciduous forests to an altitude of 1500 m; in southern India it occurs in deciduous forest areas to an elevation of 900 m in the Western Ghats. Also occurs naturally in Sri Lanka and Bangladesh eastwards through Indochina and peninsular Malaysia.

Medicinal properties and uses

The fruit is used to expel tapeworms and as an antispasmodic and carminative. Among the tribal inhabitants of eastern

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Bihar, the powdered, dried seeds are used as an anthelmintic and stomachic. The dried bark of the root is used to relieve toothache. In Ayurveda the fruit is used as a substitute for that of *Embelia ribes* to treat worm infestation, distaste, anaemia, oedema, ringworm and other skin diseases, fever, anorexia, urinary calculi, polyuria, rigidity in lower limbs, fistula, pain and vomiting. In Siddha its fruit and seed are also used as a substitute for those of *E. ribes* for treating a variety of ailments.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956), CSIR (1948–1992), Jha and Varma (1996), Kirtikar *et al.* (1935), Sivarajan and Balachandran (1994), Yoganarasimhan (1996).

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Myrtaceae

Eucalyptus globulus Labil.

Botanical synonyms

Eucalyptus gigantea Dehn., *E. glauca* DC., *E. perfoliata* Desf., *E. pulverulenta* Link

Common names

Bengali: eucalyptus; ***English***: blue gum, Tasmanian blue gum; ***Hindi***: eucalyptus; ***Kannada***: nilagiri mara; ***Sanskrit***: harita-parna, nilaniryasa, sugandhapatra, taila-parna, tailaparnah; ***Tamil***: karupuramaram.

Description

A large tree attaining a height of 60 m or more with a straight, clean bole and smooth bark peeling off in long thin strips or sheets. Leaves on young twigs opposite, sessile, cordate-ovate, glaucous grey; adult leaves alternate, lanceolate or ovate-lanceolate, acuminate, falcate. Flowers large, axillary, solitary or 2–3 together; calyx tube broadly turbinate, thick and woody. Fruits (capsules) semi-globular, containing numerous minute seeds. Stems of seedlings and coppice shoots quadrangular in cross-section.

Distribution and habitat

Native to Tasmania; introduced to India in 1843 as a fuelwood species in cool, moist, montane areas of southern India (mainly in the Nilgiris, Annamalai and Palni hills) and in the Simla hills and near Shillong (Meghalaya) in northern India. Sometimes planted in gardens.

Medicinal properties and uses

The colourless to pale yellow, aromatic oil (*cineol*) distilled from the leaves and terminal branchlets is mainly used as a mosquito repellent and as an ingredient in germicides and disinfectants. It is used as a

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counter-irritant in throat lozenges and cough syrups, and as an antiseptic and disinfectant in gargles to treat infections of the upper respiratory tract and certain skin diseases, and in ointments to treat burns. Internally it is used as a stimulating expectorant in the treatment of chronic bronchitis and asthma, frequently given by steam inhalation by mixing a few drops of oil with menthol, pine oil and compound tincture of benzoin in boiling water. Mixed with an equal amount of olive oil, it is useful as a rubefacient for rheumatism. The leaves are considered febrifuge, carminative, stimulant, expectorant and diaphoretic; their infusion is prescribed for aphthous ulcerations in the mouth and throat in children. Among the tribal inhabitants of Surguja District in northeastern Madhya Pradesh, the leaf paste or juice is applied to the forehead to relieve headaches. The dried leaves are used in the form of a tincture to treat asthma, phthisis and chronic bronchitis. The root is a purgative.

References

Asolkar *et al.* (1992), Chatterjee and Pakrashi (1995), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Kumar and Jain (1998), Yoganarasimhan (1996).

Psidium guajava L.

Botanical synonym

Psidium pyriferum L.

Common names

Bengali: goaachhi, peyara, piyara; ***English***: common guava, guava; ***Gujarati***: jamrud, jamrukh, peru, piyara; ***Hindi***: amrud, bihi, safedsafari; ***Kannada***: gova, jamaphala, perala, sebe, sibi; ***Konkani***: per; ***Malayalam***: koyya, malakkapera, pela, pera; ***Marathi***: jamba, tupkel; ***Oriya***: bojojamo, jamo, julabojamo, pidudi; ***Punjabi***: anhjirzard, amrud, amrut; ***Sanskrit***: perala; ***Tamil***: koyya, segapu, sirugoyya, vellaikoyya, uyyakkondan; ***Telegu***: ettajama, govva, goyya, jama, tellajama; ***Urdu***: amrud.

Description

A shrub or small tree up to 8 m tall, with smooth, peeling bark. Leaves short-petioled, elliptic-ovate to elliptic-oblong, often rounded at base, leathery, pubescent on lower surface, to 15 cm long and 6 cm wide; lateral nerves 10–18 pairs, prominent on undersurface. Flowers large, white and fragrant, to 2 cm long. Fruit (berry) 3–10 cm

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across, green to light yellow when ripe, or red in some varieties, pulpy; flesh creamy-white to yellow or red, depending on variety. Numerous varieties have been developed in India and elsewhere in the tropics.

Distribution and habitat

Native to tropical America from Mexico to Peru. Widely cultivated for its tasty and nutritious fruits, and naturalized in many parts of India up to 1500 m elevation.

Medicinal properties and uses

The leaves are used externally to treat wounds and ulcers. Among the tribal inhabitants of southern Bihar, the leaves are chewed as an antinarcotic to overcome alcohol intoxication. The young leaves are used as a tonic to treat diseases of the digestive system; their decoction is sometimes used to arrest vomiting and diarrhoea in cholera patients. In northeastern Orissa (Bhadrak District) the pounded tender leaves, mixed with ginger, are taken with honey and water to treat bleeding piles. An infusion of the leaves is used to treat cerebral affections, nephritis and cachexia. The pounded leaves are applied locally to relieve rheumatism. An extract of the leaves is used to treat epilepsy and chorea; the tincture is rubbed over the spine of children suffering from convulsions. A decoction of the leaves is used as a gargle to relieve toothache and gum boils. The stem bark, valued for its astringent properties, is used to relieve diarrhoea in children, generally administered in the form of a decoction. A paste of the stem bark is used as an external application to cool burns and blisters among the Baigas of northeastern Madhya Pradesh. The root bark is astringent, its decoction useful for treating infantile diarrhoea. In Unani practice, the flowers are said to cool the body and are also used in the treatment of bronchitis and applied to eye sores. The fruit is considered

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tonic, laxative and cooling. It is good for treating colic and bleeding gums. The fruit and its products (*guava jelly, guava cheese*) are astringent and useful for treating diarrhoea and dysentery. In Ayurveda, the fruit is used to treat urinary disorders.

References

Chatterjee and Pakrashi (1995), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Girach and Aminuddin (1995), Girach *et al.* (1997), Kirtikar *et al.* (1935), Verma *et al.* (1995), Yoganarasimhan (1996).

Syzygium cumini (L.) Skeels

Botanical synonyms

Calyptranthus cumini Moon, *Eugenia cumini* Druce, *E. jambolana* Lam., *Jambolifera pendunculata* Geartn., *Myrtus cumini* L., *Syzygium jambolanum* (Lam.) DC.

Common names

Bengali: chotajam, jam, kalajam; ***English***: jambol, Java plum; ***Gujarati***: jambu, jamli, rajambu; ***Hindi***: jam, jaman, jamun, phalanda; ***Kannada***: jambunerale, narala, nayinerale, nerale; ***Konkani***: jambol, jambul, zambol; ***Malayalam***: naval, perinnaral; ***Marathi***: jaman, jambul, rajjajambula; ***Oriya***: bhotojamo, chuajamo, jamo, kutijamo; ***Sanskrit***: jambu; ***Tamil***: arugadam, kottainagam, neredam, naval, sambal; ***Telegu***: jambuvu, neereedu, neredu, peddaneredu, rasaneredu; ***Urdu***: jaman, phalenda.

Description

A large, evergreen tree up to 30 m tall; bark pale brown or greyish, fairly smooth, up to 2.5 cm thick, with shallow depressions, exfoliating in woody scales, the juice from the cut bark turning purplish-black on exposure; branchlets smooth. Leaves simple, opposite, ovate or elliptic-lanceolate, 5–17 cm long and 2–7 cm wide, apex acute or rarely obtuse, narrowed at base, with numerous fine, parallel, lateral nerves, coriaceous, smooth and shiny, gland-dotted; petioles 0.8–2.5 cm long, channelled. Flowers greenish-white, sweet-scented, 0.8–1.3 cm across, arranged in 3-flowered cymes on axillary or terminal panicles 4–10 cm long; calyx tube 2.5–5 mm long, turbinate; limb trundate or obscurely 4-lobed; petals united into a thin membranous calyptra. Fruits ellipsoid or oblong, up to 2.5 cm long, smooth, dark purplish-black when ripe, edible; pulp pinkish, juicy; seeds single, shaped like the fruit, or

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2–5 compressed together. Several varieties that differ in fruit size and colour have been developed. Flowers from March to May and fruits from May to July.

Distribution and habitat

Distributed in South and Southeast Asia from Pakistan to Australia. Found throughout India to an altitude of 1800 m, usually along streams and other moist habitats, where it is often gregarious, and in sal (*Shorea robusta*) and evergreen forests. Often cultivated as an avenue tree.

Medicinal properties and uses

In Ayurvedic practice the stem bark is considered astringent to the bowels and anthelmintic; it is used to treat sore throat, bronchitis, asthma, thirst, dyspepsia, biliousness, diabetes, diarrhoea, dysentery, ulcers and blood impurities. In the form of a decoction it is used as a gargle for sore throat and a mouthwash for spongy gums. The extract of the bark pounded in water is taken to relieve giddiness among the Sahariyas in northwestern Madhya Pradesh. A decoction of the bark or powdered seeds, in combination with cardamom and cinnamon, is useful for treating diarrhoea and dysentery; the fresh bark juice, mixed with goat's milk, is used to treat infantile diarrhoea. The stem bark, powdered together with that of *Buchanania lanzan* (*Anacardiaceae*), is given to treat infantile diarrhoea among the tribal inhabitants of southern Bihar. The ripe fruits, although somewhat astringent, are widely eaten in India, and used to make preserves, jellies and drinks. The fruit juice is used as a carminative, diuretic and stomachic in the treatment of chronic diarrhoea and spleen enlargement. The fresh fruits as well as extracts of the bark, seeds and leaves are used in the treatment of diabetes; seed extracts have been shown to have a marked hypoglycaemic activity. In northeastern Karnataka, the extract of the ground fruits and that of mango (*Mangifera indica*: *Anacardiaceae*) are taken orally to treat diabetes. The leaf juice is used to treat dysentery.

References

Chatterjee and Pakrashi (1995), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Girach and Aminuddin (1995), Kirtikar *et al.* (1935), Ragupathy and Mahadevan (1991), Seetharam *et al.* (1999), Sikarwar and Kaushik (1992), Sivarajan and Balachandran (1994), Yoganarasimhan (1996).

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Syzygium operculatum (Roxb.) Niedenzu

Botanical synonyms

Calyptanthes caryophyllifolia Moon, *Cleistocalyx operculatus* (Roxb.) Merr. & Perry, *Eugenia operculata* Roxb., *Syzygium nervosum* DC.

Common names

Hindi: dugdugia, jamava, piaman, raijaman; ***Malayalam***: naral; ***Marathi***: naral; ***Oriya***: monisiajamo; ***Sanskrit***: bhumijambu.

Description

A small to medium-sized tree up to 18 m tall with smooth to flaky, grey-brown bark; twigs at first green, turning whitish; young leaves pink, older leaves yellowish-brown. Leaves 11–25 cm long and 7–12 cm wide, glabrous, rather thick, broadly elliptic or obovate, apex rounded, base rounded or cuneate, margins entire, with 7–15 pairs of secondary veins. Flowers pale yellow or white, 0.7–1.2 cm across, sessile, borne in lax, axillary cymes 5–12 cm long; petals united to form a calyptra. Fruits (berries) 7.5–10 mm long, globose or ellipsoid with truncated concave tip, succulent, purple when ripe.

Distribution and habitat

Native to tropical Asia from India and Sri Lanka eastwards through Myanmar (Burma), Indochina, southern China, Thailand, to Malesia and northern Australia. In India, it is found in the sub-Himalayan tract from the Jumna eastwards, common in savannahs and in open habitats in sal (*Shorea robusta*)-dominated forests from Bihar to Assam, southwards to north-eastern Andhra Pradesh.

Medicinal properties and uses

In Ayurveda the stem bark is considered acrid and bitter, refrigerant, heavy, tonic, astringent to the bowels, and aphrodisiac; it is used in the treatment of dysentery, diseases of the blood, bronchitis, biliousness and ulcers. In northern Orissa, a decoction of the stem bark is used as an antiseptic wash for wounds among the Paudi Bhiunya. In Chota Nagpur, the fruits are eaten to relieve rheumatism; the root,

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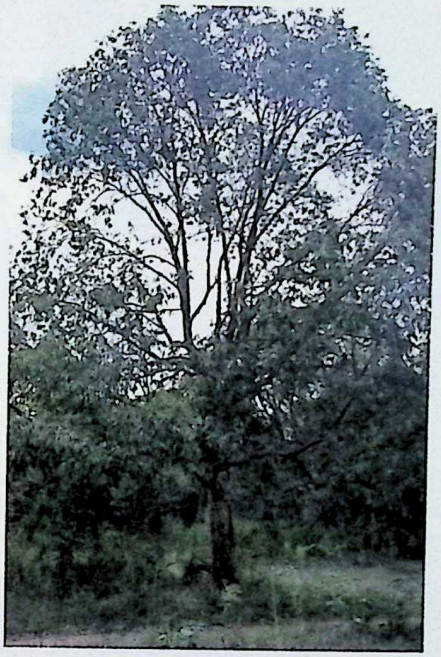

boiled down to the consistency of a syrup, is used as a rub to relieve joint pains.

References

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Nyctaginaceae

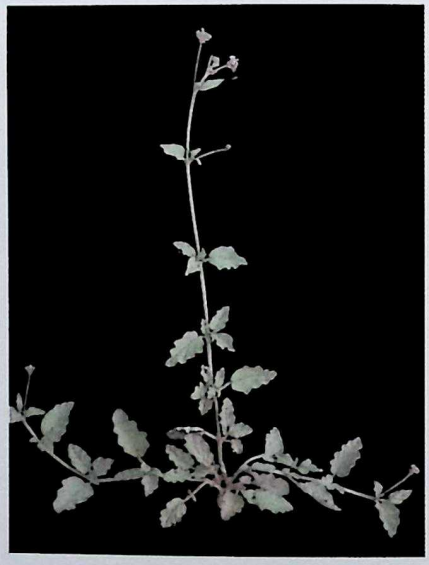
Boerhavia diffusa L.

Botanical synonyms

Boerhavia repens L., *B. repens* var. *diffusa* (L.) Hook. f., *B. repens* var. *procumbens* (Roxb.) Hook. f.

Common names

Bengali: gadhapurna, punarnava, raktapunarnaba; ***English***: spreading hogweed; ***Gujarati***: dholisaturdi, motosatodo, satodi, vakhakaparo; ***Hindi***: biskhafra, sant, thikri; ***Kannada***: balavadikae, gajjeru rakta punarnava, kommegida; ***Malayalam***: talutama, tavilama, thazhuthama, thumizhazhma, titudamma; ***Marathi***: kharaparya, pandharighentuti, raktavasu, tambadivasu; ***Oriya***: ghodapuruni; ***Punjabi***: itsit; ***Sanskrit***: punarnava, raktapunarnava, sothaghni; ***Tamil***: mukkuratte kirei, mukurattai; ***Telegu***: atikamamidi, giligeru, punarnava, yerragalijeru; ***Urdu***: bashkhira.



Description

A very variable, diffusely branched, pubescent or glabrous, prostrate herb with a stout, woody rootstock; stems creeping, often purplish, swollen at the nodes, up to 1.2 m long. Leaves long-petioled, ovate or oblong-cordate, entire or sinuate, usually whitish and smooth beneath and rough green on upper surface. Flowers red, pink or white, borne in small umbels arranged in axillary and terminal panicles. Fruit ovate, oblong, 1.3 cm long, five-ribbed, pubescent, viscid, glandular. Flowers and fruits between August and May.

Distribution and habitat

A common, pantropical weed found in grasslands, cultivated fields and orchards throughout India to an altitude of 2000 m in the Himalayas; it is occasionally cultivated in West Bengal.

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Medicinal properties and uses

The roots are the source of the Ayurvedic drug *Punarnava*; they are considered stomachic, laxative, diuretic, expectorant, antipyretic and cardiotonic; they are considered useful for stimulating heart and kidney function, and are a specific for jaundice, diabetes, general debility and oedema. It is a chief ingredient of several compound Ayurvedic formulations. The roots are also used for treating asthma and dropsy associated with Bright's disease. The rural inhabitants of Bhavnagar District in Gujarat use the roots to treat rheumatism, jaundice, oedema, obesity and piles; in this region the crushed leaves are used as an external application for swellings and boils. The leaf juice is used as a lotion for treating ophthalmia and is given internally as a blood-purifier, to relieve muscular pain and to hasten childbirth. Among the tribal inhabitants of eastern Bihar, the leaf juice is taken daily for the treatment of low blood pressure. The whole plant is reportedly used for treating inflammatory renal diseases and nephrotic syndrome, and is considered effective for oedema and ascites resulting from early cirrhosis of the liver and chronic peritonitis, abdominal tumours and cancer.

References

Bhatt and Mitaliya (1999), Bhatt *et al.* (1999), Chatterjee and Pakrashi (1991), Chopra *et al.* (1956), CSIR (1948–1992), Jha and Varma (1996), Kirtikar *et al.* (1935), Sivarajan and Balachandran (1994), Yoganarasimhan (1996).

Mirabilis jalapa L.

Common names

Bengali: gulabas, krishnakeli, sarpamani; ***English***: four o'clock plant, marvel of Peru; ***Gujarati***: guvvaji; ***Hindi***: gulabash, gulabbas; ***Kannada***: chandramallige, naalku gante hoovu, sanjamallige; ***Malayalam***: antimalari, antimantaram; ***Marathi***: gulbas; ***Punjabi***: abasi, gulabbas; ***Sanskrit***: krishnakeli, sandhyakali, sandhya-raga, tridosha; ***Tamil***: andhimalligai, antinaralu, pattarachi, pattarachu; ***Telegu***: batharachi, bhadrakshi, chandrakanta, chandramalli; ***Urdu***: guleabbas.

Description

A perennial, dichotomously branched herb or small shrub up to 1 m high; stems swollen at the nodes; roots cylindrical, roots up to 10 cm or more in diameter tuberous, green-

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ish-white inside. Leaves ovate, cordate, 5.1–6.3 cm long; petioles 2.5–3.8 cm long. Flowers fragrant, funnel-shaped, white, yellow, purple or red, striped or blotched, borne singly or in pairs. Fruit (nut) ellipsoid, resembling black pepper, 1-seeded. Flowers and fruits between July and January.

Distribution and habitat

Native to tropical America and widely cultivated in gardens throughout India; occasionally naturalized.

Medicinal properties and uses

The bruised leaves are used as a poultice to promote healing of abscesses and boils. The fresh leaf juice is demulcent and is used externally to relieve itching in urticaria and to soothe bruises and wounds. The leaves and stem are reportedly used as a tonic. The roots, rubbed with water, are applied externally to relieve contusions. The tuberous roots of the white-flowered variety are applied externally to relieve scorpion bites among the tribal inhabitants of Maharashtra.

References

Chatterjee and Pakrashi (1991), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Upadhye *et al.* (1994), Yoganarasimhan (1996).

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Ochnaceae

Ochna obtusata DC. var. *gamblei* (King ex Brandis) Kanis

Botanical synonyms

Ochna beddomei Gamble, *O. gamblei* King ex Brandis, *O. squarrosa* auct. non L.

Common names

English: golden champak; ***Hindi***: rakat-rohan; ***Kannada***: kanaka champaca, mudah, mudali, narole, ramatanachampaka; ***Konkani***: kannkchampo; ***Marathi***: sonari-chattu; ***Oriya***: bhuichampa, bonokonyari, koniari, nobinisworo, nobunisero; ***Sanskrit***: kanakachampa; ***Tamil***: chilanti, panjaram, sherundi, shilandi; ***Telegu***: jammi, sunari, sunaru, tammichetta, yerrajuvi.

Description

A small tree or shrub with thick, brown or grey, bark and stout branchlets. Leaves usually clustered at the ends of branchlets, 5–13 cm long and 3–8 cm wide, elliptic-ovate to obovate, apex rounded to obtuse, rarely acute, base cuneate-rounded to subcordate, narrowed into a short petiole up to 3 mm long, margins obscurely serrate, glaucous, nerves often irregular; stipules lanceolate, 4–6 mm long. Flowers large, yellow, fragrant, borne in umbellate panicles; peduncles up to 1.5 cm long; sepals coriaceous, 1.3–2 cm long, elliptic-oblong; petals 5–12, a little longer than the sepals. Fruit compound, consisting of 3–6 drupes, oblong-ovoid, sessile, black when ripe, surrounded by the persistent calyx.

Distribution and habitat

Occurs naturally in northeastern and peninsular India in dry habitats, from Madhya Pradesh and Bihar southwards to Karnataka and northern Tamilnadu. Frequently cultivated in parks and gardens.

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Medicinal properties and uses

The bark is a digestive tonic. An extract of the bark mixed with water is administered orally to treat dysentery by the Kolams in northern Andhra Pradesh. Among the Paharia and Santhalis in eastern Bihar, a paste of the stem bark is applied to promote healing of boils. The boiled leaves are used as an emollient cataplasm. A decoction of the root is reported to be used to ease menstrual discomfort and to treat asthma and consumption. Among the tribal inhabitants of central Orissa an extract from the crushed roots is taken for dysmenorrhoea; the fresh root is chewed to treat asthma by the Mundas in southern Bihar.

References

Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Kumar and Goel (1998), Ravisankar and Henry (1992), Sahoo and Mudgal (1995), Varma (1997), Yoganarasimhan (1996).

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Olacaceae

Olax scandens Roxb.

Botanical synonym

Olax psittacorum sensu Vahl

Common names

Bengali: kokoaru; ***Hindi***: dheniali, dheniani; ***Kannada***: baavamusti gida, bapanamushti, bapanaballi, gendasiga, karadu, nakkare; ***Marathi***: harduli, urchirri; ***Oriya***: badalia, boderia, bodobodouria; ***Tamil***: kadalranchi, malliveppam; ***Telegu***: bapanamushti, kurpodur, murikimalle, udupunakkeri.

Description

A climbing shrub or small tree up to 5 m tall with deeply fissured, grey bark; older branches with strong, slightly curved spines. Leaves yellowish-green, alternate, ovate, elliptic or oblong-elliptic, 3.5–8 cm long and 0.8–4.5 cm wide, apex narrowed to rounded, base attenuate to rounded; margins entire; petioles 4–7 mm long. Inflorescences sweetly scented, 1–3 per axil, many-flowered, 0.5–3.5 cm long; calyx 0.5–1 mm long, truncate; petals white, 3, linear-oblong, 4–9 mm long and 1.5 mm wide, lobes acute at apex. Fruit a globose or ovoid fleshy drupe 0.8–1.8 cm long and 0.6–1.2 cm wide, mostly covered by the membranous calyx, yellow to orange or pink when ripe; seeds 7 mm long and 5 mm wide. In central India flowering occurs from April to June and fruiting from November to January.

Distribution and habitat

Native to tropical Asia from the western Himalayas to Sri Lanka, eastwards through Myanmar (Burma), Indochina and Thailand to the Malay Peninsula and Java. In India it is found in moist habitats such as ravines and stream banks in the sub-Himalayan hills in Kumaon, upper Gangetic plain, Bihar, Orissa, Madhya Pradesh, southward to the Western Ghats.

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Medicinal properties and uses

The astringent bark is considered to be narcotic; it is used to treat wounds, to alleviate menstrual troubles, and in the treatment of asthma and psychic disorders. Among the Santhalis it is reportedly used for treating anaemia due to fevers. An extract of the root is taken orally to relieve muscle cramps in northeastern Karnataka. The leaves and young shoots are edible, and used as a pot-herb or green vegetable. The edible fruits are reportedly used for making sherbet.

References

Aminuddin and Girach (1996), Chatterjee and Pakrashi (1991), Chopra *et al.* (1956), CSIR (1948–1992), Seetharam *et al.* (1999), Yoganarasimhan (1996).

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Oleaceae

Jasminum multiflorum (Burm. f.) Andr.

Botanical synonyms

Jasminium pubescens (Retz.) Willd., *Nyctanthes multiflora* Burm. f.

Common names

Bengali: kundaphul; ***English***: common jasmine, downy jasmine; ***Hindi***: chameli, kunda, kundo, kundphul; ***Kannada***: bastimallige, kasturimallige, kunda, molle; ***Malayalam***: gujari, kattuchirakamulla, kundam, kurukuttimulla; ***Marathi***: mogra; ***Oriya***: kontabelo; ***Sanskrit***: kunda, kundah, sadapushpa, vasanta; ***Tamil***: magarandam, malligai; ***Telegu***: adavimalle, gujari, kundamu, malle.

Description

A large, more or less scandent, shrub; branches and young parts densely grey-tomentose. Leaves opposite, 2.5–7.5 cm long and 1.6–3.8 cm wide, ovate, apex acute, often mucronate, softly pubescent or tomentose on both surfaces, base rounded or cordate; main nerves 4–6 pairs; petioles 0.6–1 cm long, densely villous, acuminate, more or less pubescent beneath. Flowers white, sessile, star-shaped, slightly fragrant, borne in compact, short, terminal, pedunculate cymes; calyx 1.3–1.6 cm long, densely fulvous-villous, teeth 8–13 mm long; corolla tube 2–2.2 cm long, lobes 6–9, elliptic-oblong, acute, 1.3 cm long. Fruit (berry) usually 2-lobed, 0.6 cm in diameter, black when ripe, surrounded by the suberect calyx-teeth, usually 2-seeded. Flowers from February to July and fruits in July–August, depending on locality.

Distribution and habitat

Found throughout India and common in the sub-Himalayan tract to an elevation of 900 m and in moist forests of the Western Ghats to an elevation of 1500 m. Cultivated in gardens throughout tropical India.

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Medicinal properties and uses

The whole plant and flowers are considered emetic. In Ayurveda the flowers are considered cooling, laxative, digestible, cardiotonic and alexiteric; they are used to treat biliousness, inflammation and blood disorders. The dried leaves are soaked in water and applied as a poultice to promote healing of indolent ulcers. The root is used as an emmenagogue and reportedly as an antidote to cobra venom.

References

Asolkar *et al.* (1992), Chatterjee and Pakrashi (1995), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

Nyctanthes arbor-tristis L.

Botanical synonyms

Bruschia macrocarpa Bertol., *Nyctanthes arbor-tristis* var. *dentata* Hort. ex Moldenke, *N. dentata* Blume, *N. tristis* Salisb., *Parilium arbor-tristis* Gaertn., *Scabrita triflora* L.

Common names

Bengali: harsinghar, sephalika, seoli, sheoli; ***English***: coral jasmine, night jasmine; ***Gujarati***: jayaparvati, parijatak; ***Hindi***: harsinghar, harsingur, seoli, sheoli, sihau; ***Kannada***: goli, harsing, parijata; ***Konkani***: pardic, parizatak, parzonto, parzot; ***Malayalam***: mannapu, pavizhamalli, parijatakom; ***Marathi***: kharbadi, kharassi, khurasli, parijatak; ***Oriya***: godokodiko, gunjoseyoli, singaraharo; ***Punjabi***: harsinghar; ***Sanskrit***: parijata, parijatah, parijataka, sephalika; ***Tamil***: manjhapu, pavala-malligai, pavazha-malligai; ***Telegu***: kapilanagadustu, pagadamalle, parijatamu, sepali; ***Urdu***: gulejafari, harsingar.

Description

A large shrub or small tree up to 10 m tall with grey or greenish-white bark and drooping, hairy, quadrangular branchlets. Leaves opposite, 3.5–13 cm long and 2–9 cm wide, ovate, apex acute or acuminate, base rounded or cuneate, margins entire or with a few large distant teeth, rough and scabrous above, densely pubescent beneath; petioles 0.5–2 cm long, pubescent. Flowers very fragrant, small, white with an orange centre, borne in 3–7-flowered fascicles; peduncles 4-angled, slender, hairy, axillary and solitary and in terminal trichotomous cymes; corolla white, 4–8-lobed, about 1.3 cm long; tube bright orange, 0.6–0.8 cm long, obcordate, cuneate. Fruit a sub-orbicular, compressed, capsule 2 cm long and wide, separating into 2 flat 1-seeded carpels. In central India, flowers from September to October and fruits from December to February; trees leafless from March to June.

Distribution and habitat

Native to India, Thailand and Indonesia, growing wild in the sub-Himalayan region from the Chenab river to Nepal southwards through central India to northern Karnataka and Andhra Pradesh. In its natural habitat it grows gregariously on dry steep hillsides

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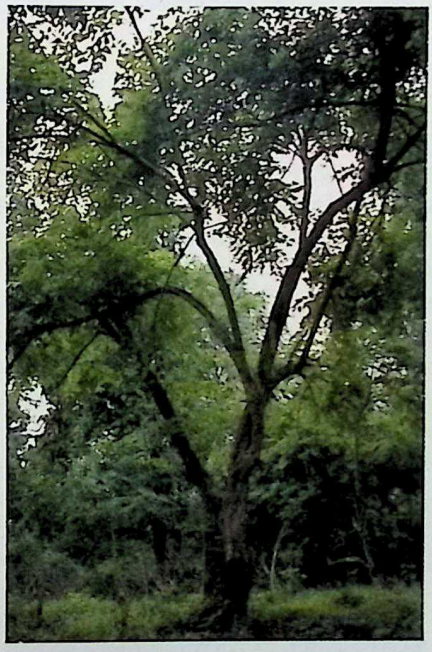
and rocky terrain and is often found in the understorey of dry deciduous forests, sometimes forming dense thickets. It is cultivated in gardens almost throughout India and in many other tropical countries for its flowers, which are valued for making garlands and as votive offerings in temples.



Medicinal properties and uses

The leaves are considered antibilious and expectorant and are useful for treating fevers and rheumatism. The young leaves, rubbed with water and ginger, are useful for relief of intermittent fever. A decoction of the leaves, prepared over a gentle fire, is prescribed for sciatica and malaria among the Kondhs of southwestern Orissa, and as a blood-purifier (in skin disease) and febrifuge among the tribal inhabitants of southern Bihar. The expressed leaf juice is acrid and bitter and used as a cholagogue, laxative, diaphoretic and diuretic. The leaf paste is used as an external application to treat ringworm, scabies and eczema among the rural inhabitants of Bhavnagar District in Gujarat and in southern West Bengal. Mixed with honey, the fresh leaf juice is taken to relieve chronic fever, and mixed with sugar it is given to children for expulsion of intestinal (thread- and round-) worms. The bark is used as an expectorant by residents of the Konkan (coastal districts of Maharashtra), and in Ayurvedic practice for treating bronchitis. A decoction of the bark, leaves, roots and flowers is used in Ayurveda for treating excessive diuresis and enlargement of the spleen. The powdered seeds are used as an application to relieve dandruff. Among the tribal inhabitants of eastern Bihar, the seed paste is applied for baldness; mixed with honey, the powdered seeds are given in the treatment of malaria.

References

Bhatt and Mitaliya (1999), Chatterjee and Pakrashi (1995), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Ghosh and Sensarma (1997), Girach (1992), Jha and Varma (1996), Kirtikar *et al.* (1935), Varma (1997).

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Schrebera swietenioides Roxb.

Common names

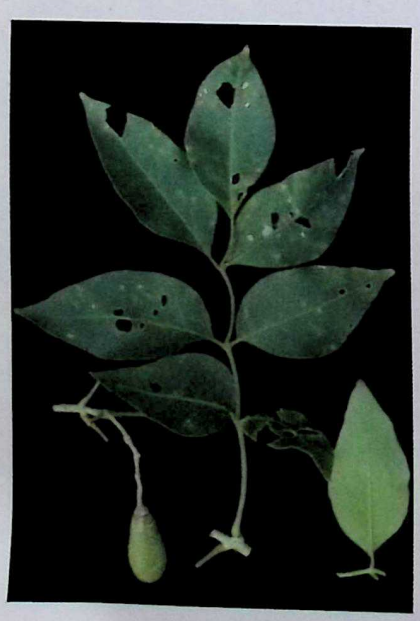
Bengali: ghantaparul, ghanto; ***English***: weaver's-beam tree; ***Gujarati***: ghant, markho, mokho, naktinunjhad, popti; ***Hindi***: banpalas, gay ka lundi, ghant, ghato, moka; ***Kannada***: bula, kalgante, maggante; ***Marathi***: moka, mokadi, mokha, nakti; ***Oriya***: ghontia, jantia, nemibure, nemiburo; ***Sanskrit***: mushkaka, muskaka, muskakah; ***Tamil***: magalingum, magganti, mogalinga, mogalingamara, mogalungum; ***Telegu***: bullakaya, magalinga, makkam, mukkalppa, tondamukkidi.

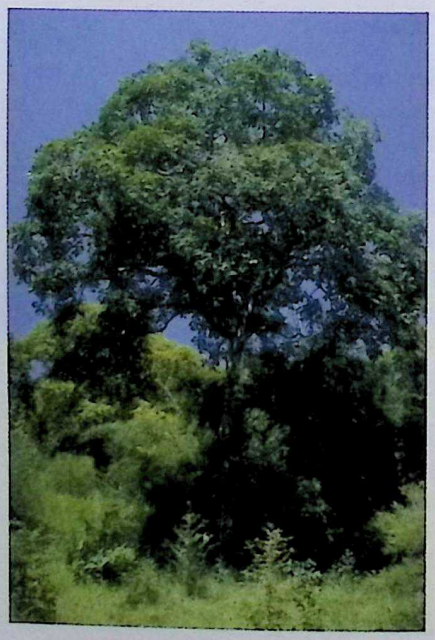
Description

A medium-sized deciduous tree with grey branchlets and thick grey or pale brown bark that exfoliates in woody scales. Leaves opposite, imparipinnate, 22–38 cm long, pubescent when young; petioles 0.6–1.3 cm long; leaflets 2–4 pairs, 7.5–12.5 cm long, ovate, ovate-lanceolate or oblong, apex obtusely acuminate, base unequal. Flowers yellowish-brown or white with brown spots, fragrant (particularly at night), borne in many-flowered, lax, terminal corymbose cymes; calyx tubular-campanulate, irregularly 4–7-lobed; corolla 8–13 mm long, tube cylindrical, lobes 4–7, with brown glandular raised dots on the upper sides. Fruits (capsule) pendulous, pear-shaped, woody, 5–7.5 cm long, 2-valved, splitting open from the apex to base; seeds 3–8, winged. In central India, flowering occurs mainly in May and June; fruits ripen between December and March; trees remain leafless between February–March and May–June.

Distribution and habitat

Found in deciduous forests in the tropical and subtropical Himalayas to an altitude of





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1200 m from Kumaon eastwards, and from Rajasthan through Chota Nagpur and Bengal southwards through peninsular India to Tamilnadu. It is occasionally grown in gardens.

Medicinal properties and uses

In Ayurveda, the root is used for treating leprosy; the leaves are considered stomachic and anthelmintic and are used to treat urinary discharges, enlargement of the spleen, diarrhoea and anaemia. A paste of the leaves and stem bark is applied locally to relieve chapped or cracked skin by the Bhils in Rajasthan. A decoction of the root bark is used in an oil preparation to soothe boils and burns.

References

Chatterjee and Pakrashi (1995), Chopra *et al.* (1956), CSIR (1948–1992), Joshi (1989), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

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Onagraceae

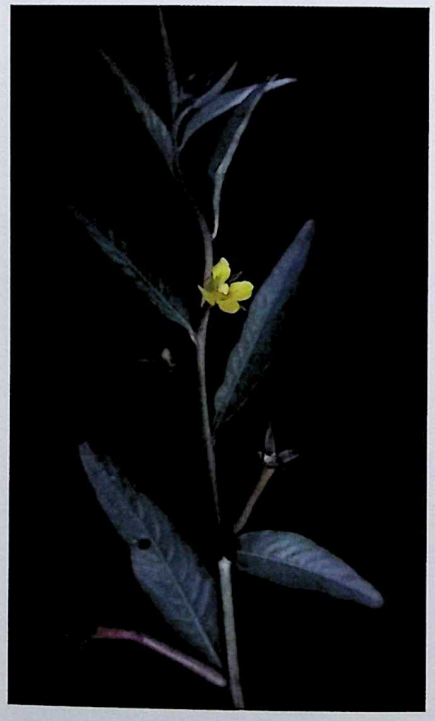
Ludwigia octovalis (Jacq.) Raven

Botanical synonyms

Jussiaea suffruticosa L., *Oenothera octovalis* Jacq.

Common names

Bengali: banlung, lalbunlunga; ***English:*** primrose willow; ***Hindi:*** banlaunga, balunga, banalounga; ***Kannada:*** kaattu kirambu, kavakula; ***Malayalam:*** karyampu, kattukkaryampu, kattuthumba; ***Marathi:*** bhulavanga, panalavanga; ***Oriya:*** bilolobongo; ***Sanskrit:*** bhalavaanga, bhallavianga; ***Tamil:*** kattukkirambu, kirambuppundu, ninkkirambu, nirkkrambu; ***Telegu:*** niruyagnivendramu.



Description

A semi-shrubby erect perennial herb, usually 0.3–1.2 m tall, occasionally to 2.5 m; stem woody below, much-branched. Leaves alternate, nearly sessile, pubescent to glabrescent, very variable in size and shape, 0.7–14.5 cm long and 0.1–4 cm wide, linear to broadly elliptic (usually lanceolate), apex acute to attenuate, base narrowly to broadly cuneate. Flowers yellow, pubescent, solitary, borne in the axils of the upper leaves; calyx hairy, tube subquadrangular, lobes 4, ovate-elliptic, 1 cm long; petals 4, broadly obovate, 0.6–1 cm long, pinnately veined. Fruit (capsule) membranous, subquadrangular, cylindrical, 8-ribbed, 2.5–5 cm long; seeds numerous, minute, ovoid, shiny, brown. In central India flowering occurs between September and November, and also in April and May.

Distribution and habitat

A pantropical species found throughout most of India, usually in open, wet and

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moist lowland habitats such as along streams and the edges of water reservoirs.

Medicinal properties and uses

The plant is considered astringent, carminative, laxative, diuretic and anthelmintic. Reduced to a pulp and steeped in buttermilk, the plant is considered useful for treating dysentery. A decoction of the plant is used as a purgative and vermifuge, and to treat flatulence, dropsy, leucorrhoea and diarrhoea. A decoction of the root is given to relieve fever. The leaves are mucilaginous and used in Malaysia in the form of a poultice to relieve headache, orchitis and nervous diseases.

References

Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

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Orchidaceae

Vanda tessellata (Roxb.) G. Don

Botanical synonyms

Aerides tessellatum Wight, *Cymbidium alagnata* Hamilton ex Wall., *C. tessellatum* Sw., *C. tesselloides* Roxb., *Epidendrum tessellatum* Roxb., *E. tesselloides* Steud., *Vanda roxburghii* R. Br., *V. tesselloides* Reichb. f., *V. unicolor* Steud.

Common names

Bengali: nai, rasna; ***Gujarati***: rasno; ***Hindi***: banda, nai, persara, rasna, vanda; ***Kannada***: bandanike, vandaka gidda; ***Marathi***: rasna; ***Sanskrit***: atirasa, bhujangakshi, gandha-nakuli, rasna, vandaka; ***Telegu***: chittiveduri, kanapabadanika, mardaru, saga, vandanika; ***Urdu***: banda.

Description

An epiphytic orchid with a stout stem, 30–60 cm high. Leaves thickly coriaceous, linear-oblong, 15–20 cm long and 1.3–2 cm wide, recurved, unequally lobed at the apex. Flowers borne in 6–10-flowered racemes up to 25 cm long; sepals tesselated with brown lines and white margins; petals yellow with brown lines and yellow margins, shorter than sepals; lip 1.6 cm long, bluish dotted with purple, side lobes rising from the mouth of the straight, conical spur. Capsules oblong, winged, 7–9 cm long, narrowly clavate-oblong, with acute ribs and a short pedicel.

Distribution and habitat

Native to tropical Asia from India, Nepal and Sri Lanka to Myanmar (Burma) and southern China. In India it is found from Uttar Pradesh to West Bengal southwards through Bihar, Madhya Pradesh and western peninsular India to Kerala and Tamilnadu to an elevation of *c.* 650 m.

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Medicinal properties and uses

The leaves, made into a paste, are applied externally to relieve fever in Chota Nagpur, to promote healing of broken bones by the Bondo tribal inhabitants of southern Orissa, and to relieve rheumatic pain among the Kondhs of southwestern Orissa. The leaf juice is used as an eardrop to treat otitis and other inflammatory conditions. A paste of the whole plant is used externally to treat acne by the Bhils in Rajasthan. The roots (rhizomes) are used in Ayurveda for the treatment of dyspepsia, bronchitis, asthma and other respiratory ailments, inflammations, rheumatism and fever; they reportedly possess antibacterial and antitubercular properties. The roots are also used as an ingredient of medicated oils that are used externally for treating diseases of the nervous system and rheumatism. In Unani, the root is recommended for treating rheumatism and related conditions, inflammations, bronchitis, toothache, boils on the scalp, and for healing bone fractures.

References

Aminuddin and Girach (1991), Chopra *et al.* (1956), CSIR (1948–1992), Girach (1992), Joshi (1989), Kirtikar *et al.* (1935), Sivarajan and Balachandran (1994), Yoganarasimhan (1996).

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Oxalidaceae

Averrhoa carambola L.

Common names

Bengali: karamak, kamranga; ***English***: carambola tree, star fruit tree; ***Gujarati***: kamarakha, tamarak; ***Hindi***: kamaranga, kamrakh, karmal; ***Kannada***: kamarakshi, kamarakshi mara; ***Konkani***: carambol; ***Malayalam***: chaturpuli, kamarangam, pulicchi, saturappuli, tamaratta; ***Marathi***: kamarakha, karmare; ***Oriya***: koromonga; ***Sanskrit***: brihaddala, dharaphala, karmara, karmaranga; ***Tamil***: kandasagadam, sagadam, sigam, tamarattai, tamratta; ***Telegu***: kamaarak-karmel, karamonga, tamarta; ***Urdu***: kamarakha.

Description

An ornamental tree, 7.5–10 m tall, with drooping branches. Leaves alternate, imparipinnate, irritable to the touch; leaflets 5–11, ovate-oblong, 3.8–6.3 cm long and 2–3.2 cm wide, apex acuminate, base oblique, acute, margins entire; petiolules short, stout, pubescent. Flowers white or purple, borne in short axillary racemes or arising from old branches. The fruit is a large, angled, 3- to 5-ribbed ovoid berry, yellow when ripe; seeds arillate.

Distribution and habitat

Native to the Moluccas (in Indonesia), introduced to Kerala and other parts of India in the distant past. Cultivated for its acidic or sweet (depending on variety) fruits in gardens throughout the hotter parts of India in frost-free locales in the plains and lower hills up to 1200 m elevation. It is occasionally naturalized in the vicinity of plantings.

Medicinal properties and uses

All parts of the tree are credited with medicinal properties. The root is administered as an antidote in poisoning. The crushed leaves or shoots, reputed to be antiscorbutic, are applied externally to treat chickenpox,

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ringworm, scabies and headache. A decoction of the leaves is used to treat aphthae and angina and to arrest vomiting. The flowers are said to be vermicidal. The fruits are laxative, antiscorbutic, febrifuge, antidysenteric and antiphlogistic. The dried fruits are considered one of the best cooling agents in traditional Indian medicine. The fruit juice is a good remedy for bleeding piles and is useful in relieving thirst and febrile excitement. The seeds are said to increase the flow of milk and in large doses act as an emmenagogue and can cause abortion. They are generally administered as an infusion, decoction or tincture, and are used to treat asthma, colic and jaundice. The seeds have slight intoxicating and emetic properties.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

Biophytum sensitivum (L.) Don

Botanical synonym

Oxalis sensitivum L.

Common names

Bengali: jhalai; ***Gujarati***: jharera, zarer; ***Hindi***: lajalu, lakshana, zarer; ***Kannada***: horamuni, jalapushpam, lajjaluba; ***Malayalam***: mukkutti; ***Marathi***: jharera, ladjou, lahanamulki; ***Sanskrit***: jalapushpamm, lajjaluka; ***Tamil***: mukkutti, thindavadi; ***Telegu***: jalapushpamu.

Description

A variable annual herb up to 25 cm tall. Leaves sensitive to touch, pinnately compound, crowded into a rosette atop the stem, 3.8–12.7 cm long, leaflets 3–12 pairs, opposite, oblong, the terminal pair the largest. Flowers dimorphic, yellow, 0.8 cm across, on peduncles of varying lengths up to 10 cm. Capsules globose or elliptic, shining, 5-valved, approximately 3.5 mm long; seeds minute with obliquely transverse tubercled ridges. Flowers and fruits between August and December.

Distribution and habitat

Commonly found as a weed in open habitats during the rainy season throughout the hotter parts of India, ascending to 1800 m in the Himalayas.

Medicinal properties and uses

The plant is reported to possess tonic, stimulant and styptic properties and is used to treat chest complaints, insomnia,

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convulsions, cramps and inflammatory tumours. The leaves, rubbed with water, act as a diuretic when given internally; they also possess astringent and antiseptic properties. The pounded or bruised leaves or their juice is used as a dressing for burns and contusions. The boiled leaves are used by the Bhils and Dhankas of Gujarat to relieve rheumatic pain. A paste of the leaves, as well as the powdered seeds, is applied to stop bleeding and promote healing of wounds and cuts. A decoction of the leaves is given for asthma and phthisis. The mature leaves contain an insulin-like principle and are recommended for diabetes. The leaf juice is applied for temporary relief of scorpion stings by the Gonds of northern Andhra Pradesh. The juice of the plant is reportedly taken as a remedy for malarial fever among the Mahalia in the Chotanagpur region of Bihar. The whole plant is eaten as an aphrodisiac among the tribal inhabitants of Surguja District in northeastern Madhya Pradesh. A decoction of the roots is reportedly used for fevers and to treat gonorrhoea and lithiasis.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956), CSIR (1948–1992), Jain *et al.* (1989), Kirtikar *et al.* (1935), Kumar and Jain (1998), Ravisankar and Henry (1992).

Oxalis acetosella L.

Common names

English: wood sorrel; ***Sanskrit***: cangeri.

Description

A small, delicate, stemless perennial herb, 5–15 cm high, with creeping, reddish, knotty, scaly rhizomes. Leaves radical, trifoliate; leaflets broadly obcordate, light green, often tinged purple beneath, hairy; petioles 5–15 cm long, somewhat thickened and often purple at base, light green and grooved higher up; stipules large, broad and membranous. Flowers solitary, axillary, 1–1.8 cm in diameter, white or pale rose, veined with purple, yellowish at base, on elongated slender peduncles. Fruit an ovoid, 5-angled, erect capsule, 8 mm long, containing 2–3 seeds in each cell.

Distribution and habitat

Occurs naturally in the temperate Himalayan region of northern India from 2500 to 3700 m elevation; also cultivated throughout India.

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Medicinal properties and uses

The plant possesses cooling, diuretic and antiscorbutic properties. It is used to treat digestive and liver disorders, febrile diseases, urinary affections, catarrh, gonorrhoea and haemorrhage. It is also used to remove cancerous growths from the lips. In Ayurveda, the plant is used as a substitute for *Oxalis corniculata*. The edible leaves have a refreshing, slightly acidic flavour, and are used as a substitute for sorrel (*Rumex acetosa*: *Polygonaceae*) in salads.

Warning

The plant is poisonous when taken in large doses.

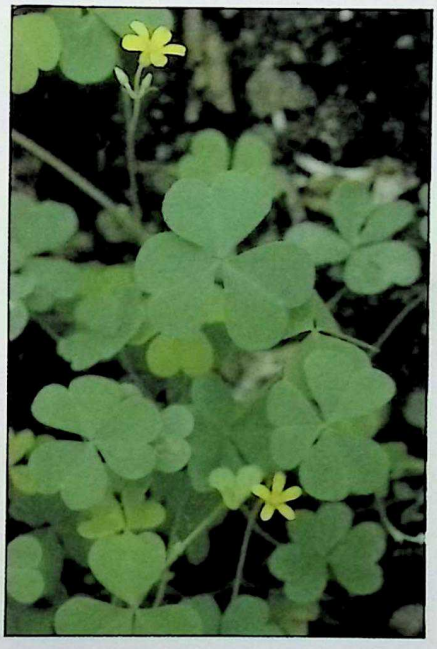
References

Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

Oxalis corniculata L.

Common names

Bengali: amrul, chalmori, chukatripati, omloti; ***English***: Indian sorrel; ***Hindi***: amrul, amrul sak, chuka tripati; ***Kannada***: kulichikkai, pullam purachai, uppinasoppu; ***Malayalam***: poliyarala, puliyaral; ***Marathi***: ambuti, anjati, bhinsarpati; ***Oriya***: ambilati; ***Punjabi***: amlika, amrul, chukha, khattamitha, surchi, travuke; ***Sanskrit***: amlika, cangeri, changeri, chukrika; ***Tamil***: paliakiri, puliyarai; ***Telegu***: ambotikura, pallachinta, pullachanchali, pulichinta.



Description

A small annual or perennial, procumbent or more or less erect, herb 6–25 cm high, pubescent with appressed hairs. Leaves few, palmately trifoliate; leaflets 1.2–2.5 cm long, obcordate, base cuneate, margins entire; petioles 3.5–9 cm long, very slender, pubescent. Flowers yellow, axillary in umbellate clusters on slender axillary peduncles; sepals 3–4.5 mm long, oblong, obtuse, hairy outside; petals yellow, oblong, rounded at apex, emarginate, twice as long as sepals. Capsules 2 cm long, linear-oblong, 5-angled, tomentose; seeds numerous, dark brown, broadly ovoid, transversely striate.

Distribution and habitat

A cosmopolitan weed, common on banks of ponds and in moist and shady habitats in fields and degraded lands throughout the warmer parts of India up to 3000 m elevation.

Medicinal properties and uses

The plant possesses astringent, vermifuge, emmenagogue and antiseptic properties. In Ayurveda the whole plant is reportedly used in the treatment of indigestion and diarrhoea in children, dyspepsia, dysentery, piles and biliousness. Fresh juice of the plant is used to cure dyspepsia, piles, anaemia and tympanites. Pills made from a paste of the whole plant mixed with black pepper are taken to treat piles among the Mundas in southern Bihar. The leaves of the plant are considered cooling, antiscorbutic and appetizing. They are used to treat fevers, dysentery, scurvy and biliousness, and for removing corns,

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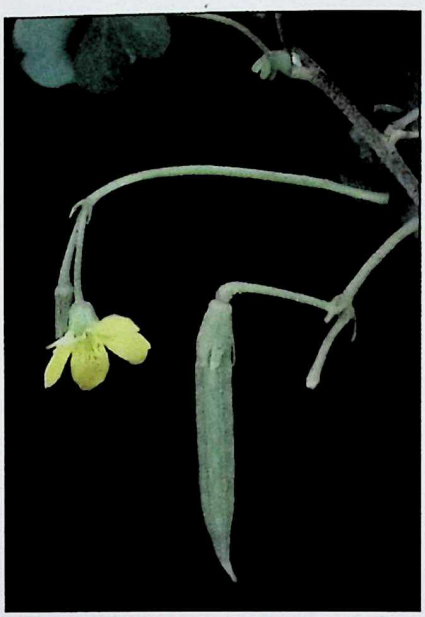
warts and other skin excrescences. An infusion of the leaves is used to remove opacities of the cornea, and as an eyedrop to relieve itching eyelids. The leaf juice is sometimes given to counteract intoxication produced by the seeds of *Datura* (*Solanaceae*); it is also taken to treat chronic dysentery and diarrhoea among the inhabitants of southern Orissa and the Uraon in southern Bihar. The leaves have a pleasantly acidic taste, are rich in vitamin C and calcium, and can be eaten raw in salads; they are also used in sandwiches, chutneys and pickles.



References

Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Mohanty *et al.* (1996), Sivarajan and Balachandran (1994), Varma (1997).

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Pandanaceae

Pandanus fascicularis Lam.

Botanical synonyms

Hasskarlia leucacantha Walp., *Pandanus latifolius* Hassk., *P. leucanthus* Hassk., *P. odoratissimus* L. f., *P. tectorius* auct. non Soland. ex Parkinson, *P. verus* Rumph.

Common names

Bengali: kedki-keya, keori, keya; ***English***: fragrant screw-pine, screw-pine, umbrella tree; ***Gujarati***: kewoda; ***Hindi***: keora, ketki, keura, kewda; ***Kannada***: kaida, kedige, kyad-agegida, tale mara, taale hoovu; ***Konkani***: ato, covasso, kedagi, keto; ***Malayalam***: kaida, kaitha, thala; ***Marathi***: keoda, keora; ***Oriya***: ketoki, khia, kiya, konta; ***Sanskrit***: ketaki; ***Tamil***: kaitha, tazhai, thalay; ***Telegu***: ganjangi, ketaki, mogali, mugali (male plant); ***Urdu***: keora.

Description

A densely branched shrub, rarely erect, up to 6 m tall, supported by aerial roots. Leaves glaucous-green, coriaceous, 0.9–1.5 m long, apex caudate-acuminate, with whitish spines 0.3–1 cm long on the margins and midrib. Male and female flowers borne on separate plants: male flowers on numerous 5–10-cm-long cylindric spikes comprising the 25–50-cm-long spadix enclosed in a long, white, fragrant spathe; female flowers in a solitary spadix 5 cm in diameter. Fruit (syncarpium) oblong or globose, 15–25 cm in diameter, yellow or red when ripe, composed of numerous drupes.

Distribution and habitat

Native to the Old World tropics from Mauritius to Polynesia. In India it is found along the coast, typically forming a dense, impenetrable thicket above the high water mark on beaches, and along riverbanks and ponds.

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Medicinal properties and uses

The leaves are considered alexiteric, aphrodisiac and soporific; they are reportedly used in Unani medicine for treating leprosy, smallpox, scabies and diseases of the heart and brain, and in Ayurveda for strangury and tumours. Among the inhabitants of Bhadrak District in northeastern Orissa, the basal portion of the leaf is eaten with salt to treat coughs. The anthers of the male flowers are given for relieving earache, headache and diseases of the blood. The oil or attar obtained from the male spadices (known as *kewda* in Hindi) is considered stimulant and antispasmodic and administered for headache and rheumatism. The terminal buds and tender floral leaves can be eaten as a cooked vegetable; in the Philippines, the leaves are cooked (but not eaten) with rice to provide a pleasant fragrance. The stilt roots are used for making fibres and brushes.

References

Chopra *et al.* (1956, 1969), CSIR (1948–1992), Girach *et al.* (1997), Kirtikar *et al.* (1935), Nadkarni (1954), Ragupathy and Mahadevan (1991), Yoganarasimhan (1996).

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Papaveraceae

Argemone mexicana L.

Common names

Bengali: shialkanta; ***English***: Mexican poppy, prickly poppy; ***Gujarati***: darudi; ***Hindi***: bharbhand, brahmadundi, satynashi; ***Kannada***: datturigidda; ***Konkani***: firingidutro, redonoxi; ***Malayalam***: bhrahmadanti, ponnummattam, ponnummattu; ***Marathi***: daruri, pivla dhotra; ***Oriya***: kantakusham, nipania; ***Punjabi***: bhatkateya; ***Sanskrit***: brahmadandi, pitapushpa, srigalakantaka, svarnakshiri; ***Tamil***: bramadandu, kurukkum; ***Telegu***: brahmadandi; ***Urdu***: baramdandi.

Description

An erect, prickly annual herb up to 1.2 m tall, with yellow sap. Leaves sessile, with slightly incised undulated margins and white veins, spiny on margins, midrib and veins beneath. Flowers yellow, 2.5–7.5 cm in diameter, with 4–6 petals. Capsules 2–4 cm long, elliptic or oblong, prickly, rarely unarmed; seeds numerous, small, round, blackish-brown, deeply reticulate and pitted. Flowers and fruits throughout the year in most localities, but mainly from February to August.

Distribution and habitat

Native to Mexico and the Caribbean. Naturalized throughout India up to 1500 m elevation, in disturbed habitats such as cultivated areas, roadsides, riverbeds, fields, forest edges and secondary forests.

Medicinal properties and uses

The seed oil, leaf juice and roots are applied externally to relieve skin diseases and indolent ulcers. The yellow juice of the plant is used externally in the treatment of dropsy, jaundice, skin affections such as ulcers, boils and eczema, and to relieve rheumatic pains. Among the Bhils

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of Rajasthan, the leaves are rubbed on affected areas to treat scabies and the leaf juice is used to treat syphilis. The crushed leaves mixed with coconut oil are applied to the body to treat leucorrhoea among the tribal inhabitants of Prakasam District in south-central Andhra Pradesh. The aqueous extracts of flowers and leaves possess weak antibiotic properties, and those of the bark and root possess antiviral and antifungal properties. In Ayurveda the roots are used as an anthelmintic, and their juice as a collyrium to cure ophthalmia and opacities of the cornea. Among the tribal inhabitants of Surguja District in northeastern Madhya Pradesh, a decoction of the roots is used to treat cough and the root powder, mixed with oil, is used as an external application for eczema. The dried, powdered roots are taken internally as a cure for menorrhagia among the Kondhs of southwestern Orissa. The root bark extract is taken with clarified butter (*ghee*) as a treatment for spermatorrhoea among the tribal inhabitants of central Orissa. Among the Korku of Akola District in Maharashtra, the burnt roots are used in a fomentation for treating piles. A paste of the root, mixed with onion, is reportedly used in Ghana as an application in expelling guinea worms.

Warning

The seeds are poisonous in large quantities. Ingestion of argemone seed oil causes high-tension glaucoma, dropsy, diarrhoea, vomiting and anaemia. External contact of the seed oil with the eyes can reportedly cause blindness. The toxicity is attributed to the presence of an alkaloid (sanguinarine), which is also carcinogenic. Both the seeds and flowers are considered narcotic.

References

Asolkar *et al.* (1992), Bhatt and Mitaliya (1999), Chatterjee and Pakrashi (1991), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Girach (1992), Jain *et al.* (1989), Joshi (1989), Katewa and Arora (1997), Kirtikar *et al.* (1935), Kumar and Jain (1998), Ravisankar and Henry (1992), Sahoo and Mudgal (1995), Sivarajan and Balachandran (1994), Vijaya Kumar and Pullaiah (1998).

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Parkeriaceae

Ceratopteris thalictroides (L.) Brongn.

Botanical synonym

Ceratopteris siliquosa (L.) Copeland

Common name

English: water fern.

Description

A stout, fleshy, tufted, aquatic fern, with dimorphic fronds consisting of simple, slightly divided or 2–3 pinnate sterile fronds; fertile fronds with forked segments produced on mature plants.

Distribution and habitat

Native to tropical Asia and the Pacific Islands. Found throughout India in shallow waters in lakes, reservoirs and ditches in rice fields, or sometimes in mud and wet soils.

Medicinal properties and uses

The fronds are used as a poultice in skin complaints. In China the plant is used as a tonic and styptic. The expanded fronds are boiled and eaten as a vegetable, while the unexpanded fronds are eaten raw as a salad vegetable.

References

Chopra *et al.* (1956), CSIR (1948–1992).

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Passifloraceae

Passiflora edulis Sims

Common names

English: passion fruit, purple granadilla.

Description

A woody climber up to 12 m long. Leaves deeply 3-lobed, suborbicular to broadly ovate in outline, 5–11 cm long and 4–10 cm wide, base rounded or shallowly cordate, margins coarsely serrate, 3-nerved from the base, lobes elliptic or oblong, up to 8 cm, apex acute or acuminate; petioles 1–4 cm long, biglandular at apex; stipules lanceolate or linear-lanceolate, 10 mm long and 1 mm wide. Flowers fragrant, solitary, up to 7 cm in diameter, white but often tinged with purple. Fruit 4–5 cm in diameter, globose or ovoid, yellow when ripe, with a hard rind, enclosing an acidic, edible pulp and numerous small black seeds.

Distribution and habitat

Native to Brazil, now cultivated pantropically for its edible fruits and ornamental flowers; often naturalized in open habitats.

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Medicinal properties and uses

The fruits are considered diuretic. In Brazil, the fruit pulp is used as a stimulant and tonic.

References

Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935).

Passiflora foetida L.

Common names

English: fetid passion flower; ***Kannada***: kukkiballi; ***Malayalam***: chadayan, poochapazham; ***Sanskrit***: mukkopeera; ***Tamil***: mupparisavalli, siruppunaikkalli; ***Telegu***: tellajumiki.

Description

A herbaceous, fetid-smelling climber up to 3 m long. Leaves alternate, 3-lobed, 4–11 cm long and 3–10 cm wide, silky-hairy, with glandular hairs on both surfaces, base cordate, apex acute-acuminate; petioles 1.3–6 cm long, densely silky-hairy, with scattered glandular hairs; stipules semi-auriculate, 5–10 mm long, deeply cleft into filiform, gland-tipped segments. Flowers solitary, 2.5–5 cm across, greenish-white, pink, lilac or purplish. Fruit (berry) globose, smooth, with scattered cilia. The species is highly variable morphologically.

Distribution and habitat

Native to tropical America; cultivated and naturalized in open habitats in many parts of India.

Medicinal properties and uses

The fruits are used as an emetic. The leaves are used as a dressing for wounds, and are sometimes applied to the head to treat headache and giddiness. Their decoction is reportedly used to treat asthma and biliousness. A decoction of the leaves or roots is said to be an emmenagogue and useful for treating hysteria.

Warning

The unripe fruits are poisonous, and contain a cyanogenic glucoside.

References

Chopra *et al.* (1956), CSIR (1948–1992), Nadkarni (1954), Yoganarasimhan (1996).

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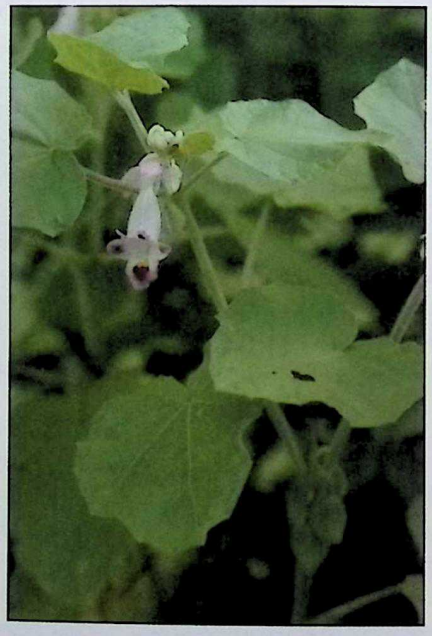
Pedaliaceae

Martynia annua L.



Botanical synonym

Carpoceras angulata A. Rich., *Disteria angulosa* Raf., *Martynia angulosa* Lam., *M. diandra* Gloxin, *Vatkea diandra* O. Hoffm.

Common names

Bengali: baghnoki, bagnakha; ***English***: devil's claw, snake's head, tiger's claw; ***Gujarati***: vichchida, vichhudo, vinchhudo; ***Hindi***: bichu, hathajori; ***Kannada***: garuda mooga; ***Malayalam***: pulinakham; ***Marathi***: vinchu; ***Punjabi***: bichu, hathajori; ***Sanskrit***: kakanasa, nrtyakundala; ***Tamil***: pullinagam, thelkodukkukai; ***Telegu***: garudamukku, telukondichettu; ***Urdu***: hattajori.

Description

A herbaceous, erect, branched, glandular-hairy annual, 0.3–2 m high. Leaves opposite, broadly ovate to deltoid, 7–23 cm long and 7–20 cm wide; base cordate, apex acute, margins repand-dentate; petioles 7–18 cm long. Flowers large, foxglove-shaped, pink and dark purple blotched with yellow inside, borne in 10–20-flowered racemes 4–10 cm long. Fruit hard, woody, with 2 sharp recurved hooks; seeds oblong. Flowers and fruits throughout the year.

Distribution and habitat

Native to Mexico and Central America; introduced and naturalized in many tropical areas. Found throughout India on highly disturbed sites such as waste areas, roadsides and rubbish heaps.

Medicinal properties and uses

In Ayurvedic practice, the plant is used as a substitute for *Asclepias curassavica* (*Asclepiadaceae*). The leaves are reportedly used to treat epilepsy and are applied to tuberculous glands of the neck; the leaf juice is used as a gargle to relieve sore

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throat. The fruit is considered alexiteric and useful for relieving inflammations. Among tribal groups in Rajasthan the oil distilled from the fruits and seeds is used as an external application for scabies. A paste of the seeds (or fruits) is used as a local sedative and is thought to have a curative effect when applied to the bites of venomous insects and scorpions. The aqueous extract of the crushed root is given orally to relieve painful urination associated with hardening of the urinary bladder sphincter due to a severe attack of cold among the Baigas in northeastern Madhya Pradesh.

References

Bhatt and Mitaliya (1999), Bhatt *et al.* (1999), Chopra *et al.* (1956), CSIR (1948–1992), Joshi (1989), Nadkarni (1954), Verma *et al.* (1995), Yoganarasimhan (1996).

Sesamum orientale L.

Botanical synonym

Sesamum indicum L.

Common names

Bengali: til; ***English***: gingelly, sesame; ***Gujarati***: tal, til; ***Hindi***: til; ***Kannada***: ellu, yellu; ***Konkani***: pilli, tili, till; ***Malayalam***: ellu, karuthellu; ***Marathi***: til; ***Oriya***: khasu, rasi; ***Punjabi***: til, tili; ***Sanskrit***: snehaphala, tila, tilah, tilaha; ***Tamil***: ellu, yelluchedi; ***Telegu***: nuvvulu; ***Urdu***: til.

Description

A strong-smelling, erect, branched or unbranched annual, 60–180 cm high; upper parts of stems and branches obtusely quadrangular and furrowed. Leaves very variable, simple or pinnately compound, lower leaves 6–15 cm long and 3–10 cm wide, long-petioled (3–8 cm), base rounded, obtuse or acute, margins subentire to irregularly serrate-dentate, apex acute or obtuse; upper leaves shorter-petioled (less than 5 mm), ovate-oblong to oblong-lanceolate or linear, 3–6 cm long and 0.5–3 cm wide, base rounded to acute, margins usually entire, apex acute. Flowers white, pink or mauve-pink with darker markings, borne in racemes in leaf axils. Fruit capsular, oblong-quadrangular, slightly compressed, deeply 4-grooved, 1.5–5 cm long; seeds black, brown or white, 2.5–3 mm long and 1.5 mm wide.

Distribution and habitat

Believed to have originated in the Ethiopian region of Africa, *sesame* has been cultivated for several thousands of years in India, and is known to have been an important crop at Harappa during the period of the Indus Valley civilization (*c.* 3600–1750 BC). Numerous varieties are cultivated throughout the plains of India up to an altitude of 1200. It is often naturalized, especially along roadsides and in abandoned fields and waste areas in drier localities.

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Medicinal properties and uses

The edible seeds are considered emollient, diuretic, lactagogue and a nourishing tonic. They are commonly used in Ayurveda, Unani and Siddha. A paste of the seeds mixed with butter is said to be useful for treating bleeding piles. A decoction of the seeds is used as an emmenagogue and to relieve coughs. Combined with linseed, the decoction of the seeds is also used as an aphrodisiac. A plaster made from the ground seeds is applied to relieve burns and scalds and a poultice of the seeds is used to promote healing of ulcers. The powdered seeds are used to treat amenorrhoea and dysmenorrhoea. The fresh seeds are used to treat ophthalmic and skin complaints. The seeds and seed oil are used as a demulcent in the treatment of dysentery and urinary complaints. A hot poultice of the leaves is used to relieve postnatal pains by Bhil women in Rajasthan.

References

Chopra *et al.* (1956), CSIR (1948–1992), Joshi (1989), Kirtikar *et al.* (1935), Nadkarni (1954), Yoganarasimhan (1996).

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Piperaceae

Piper longum L.

Botanical synonym

Chavica roxburghii Miq.

Common names

Bengali: piplamor, piplamul, pipli, pipul; ***English:*** Indian long pepper; ***Gujarati:*** piper, pipli; ***Hindi:*** pipal, pipali, pipalmal; ***Kannada:*** hippali, tippali; ***Malayalam:*** chapala, kattutippali, magadhi, pippali, tippali; ***Marathi:*** pimpli; ***Oriya:*** baihehi, krykola, moghodha, pippoli; ***Punjabi:*** filfil-daraz, maghzpipal, parfilfil, pipal, pilamul; ***Sanskrit:*** kana, magedham, pippali; ***Tamil:*** modi (root), pippili, sirumulam, tippili (berry), vettilai; ***Telegu:*** modi (root), pipili, pippalu (berry); ***Urdu:*** pipul.

Description

A slender, aromatic climber with perennial woody roots; stems jointed, creeping, young shoots downy. Leaves simple, alternate, 5–12 cm long and 3–6 cm wide, glabrous, ovate, base cordate with broad rounded lobes, apex subacute, margins entire. Flowers minute on unisexual, axillary, cylindrical spikes; green at first, turning yellow, up to 5 cm long; male spikes longer than female. Fruits (berries) ovoid, yellowish-orange turning dark red to blackish, sunk in the fleshy spike 2.5–3.8 cm long. Flowers during the rainy season and fruits during the autumn.

Distribution and habitat

Considered native to tropical and subtropical India, Nepal, Bangladesh, Myanmar (Burma), Sri Lanka and the Malay Peninsula. In India it is found from the central Himalayas to Assam, the lower hills of West Bengal, and in the evergreen forests of peninsular India from Konkan (Maharashtra) to Travancore (Kerala). It is occasionally cultivated in northeastern and southern India for its fruits, used as a spice and in pickles and preserves.

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Medicinal properties and uses

The dried roots, as well as the immature and mature fruits, are used extensively, alone and in combination with other plant drugs to treat a broad range of ailments in traditional Indian medicine. The dried roots and thicker stems, known commercially as *Piplamul*, are an important drug in the Ayurvedic and Unani systems. The roots and fruits are used to treat dysentery and leucoderma, as a cholagogue for treating bile duct and gall bladder obstruction, and as a counter-irritant and analgesic for relieving muscular pains and inflammations. A decoction of the dried immature fruit and root, or the powdered fruits mixed with honey, is used to treat chronic bronchitis, cough and cold. An infusion of the powdered fruits is given to women after childbirth to check bleeding and fever. It is an important ingredient in a medicated oil used externally for sciatica and paraplegia.

References

Chatterjee and Pakrashi (1991), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935), Nadkarni (1954), Sivarajan and Balachandran (1994), Yoganarasimhan (1996).

Piper nigrum L.

Botanical synonym

Piper baccatum Cas.

Common names

Bengali: golmorich, kalimirch, kalamorich; ***English:*** black pepper, common pepper; ***Gujarati:*** kalamari, kalomirich; ***Hindi:*** kalimirch, kalamorich, golmorich; ***Kannada:*** menasinaballi, kare menasu, menasinakalu; ***Konkani:*** miriam; ***Malayalam:*** kurumulaku, mulakukoti, nallamulaka; ***Marathi:*** kalimirch, mire; ***Oriya:*** golomoricho, moricho; ***Punjabi:*** golmirich; ***Sanskrit:*** hapusha, marica, maricha, ushana; ***Tamil:*** milagu; ***Telegu:*** miriyala tige; ***Urdu:*** kalimarich.

Description

A tall, glabrous, perennial climber with stout branches rooting at the nodes. Leaves coriaceous, entire, 12–18 cm long and 5–13 cm wide, apex acuminate, base acute, rounded or cordate, 5–9-nerved; petioles 1.3–2.5 cm long. Flowers minute, borne in spikes of variable length (5–15 cm) and thickness. Fruits (berries) ovoid or globose, bright red when ripe; seeds usually globose, hard. Flowers during the rainy season and fruits during the winter months. There are numerous cultivated types that vary in leaf, flower spike and fruit colour and morphology. The wild type, found in the Western Ghats, rarely sets fruit.

Distribution and habitat

One of the most ancient crops cultivated in India, its dried fruits having been an important export crop for at least 2000 years, black pepper probably originated in the rain forests of the Western Ghats, where wild types are still found. Today, numerous cultivated types are grown, usually on tree crops in mixed-species home gardens, in moist and wet tropical regions of India, Sri Lanka and in many other countries,

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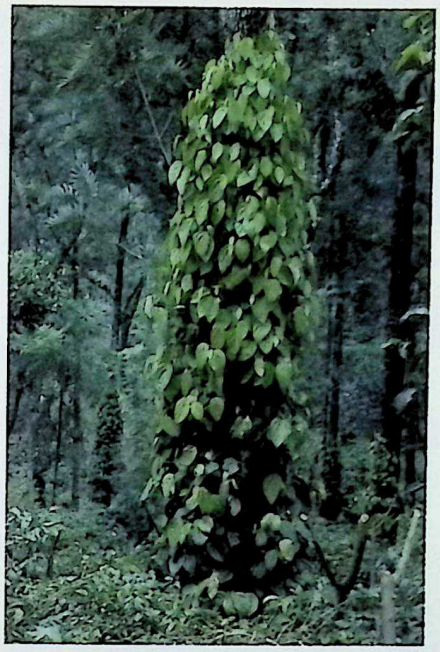
particularly Indonesia, Malaysia, Madagascar and Brazil.



Medicinal properties and uses

Black pepper (dried fruits) is commonly used as an aromatic stimulant to treat cholera, weakness following fevers, vertigo and coma, as a stomachic for dyspepsia and flatulence, as an antiperiodic in malarial fever, and as an alterative in the treatment of paraplegia and arthritic diseases. It is valued for its rubefacient properties and is used as a local application for sore throat, piles and some skin diseases.

References

Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935), Nadkarni (1954), Yoganarasimhan (1996).

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Plumbaginaceae

Plumbago auriculata Lam.

Botanical synonym

Plumbago capensis Thunb.

Common names

Sanskrit: chitraka, krishtnachitraka, nilacitraka, nilagnishikha, nilashikha; ***Telegu***: chitramulamu, chitrika.

Description

An erect or climbing shrub up to 1.5 m tall. Leaves obovate to spathulate, up to 6 cm long and 2.5 cm wide, apex obtuse, base attenuate, glabrous beneath; petioles very short, dilated to form rounded, amplexicaul, stipule-like auricles. Flowers blue-purple or occasionally white; calyx 1–1.8 cm long, upper portion with glands; corolla tube slender, delicate, up to 4 cm long. Flowering and fruiting occur throughout the year.

Distribution and habitat

Indigenous to South Africa and grown in gardens in India and in other tropical countries as an ornamental plant.

Medicinal properties and uses

A decoction of the plant is used as a remedy for blackwater fever. The root is used as a styptic in cases of scrofula and its infusion is considered emetic. The powdered root is taken as a snuff to relieve headache; it is also used as an external application to remove warts. Among the tribal inhabitants of southern Andhra Pradesh, the ground roots and seeds are used to treat pyorrhoea and tooth decay.

References

CSIR (1948–1992), Rao *et al.* (1996).

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Plumbago zeylanica L.

Common names

Bengali: chita, chitarak, chitrak; ***English***: Ceylon leadwort, white lead wort; ***Gujarati***: chitaro, chitrak, gholochitro; ***Hindi***: chita, chitarak, chitrak; ***Kannada***: bili chitra mula, chitramula, chitramulike, vahni; ***Konkani***: chitramula; ***Malayalam***: tumba koduveli, tumpukotuveli, vellakoduveli; ***Marathi***: chitraka, chitramula; ***Oriya***: chitamulo, chitapru, krisanu, ogni; ***Punjabi***: chitrak; ***Sanskrit***: agni, chitraca, chitraka, citraka; ***Tamil***: cithiramulam, sittragam, vellaikkodiveli, vengodiveli; ***Telegu***: agnimata, chitramulam; ***Urdu***: chitralakri.

Description

A perennial herb or straggling shrub to 1.5 m tall, with spreading, terete, glabrous branches. Leaves thin, glabrous, 4–16 cm long and 2–7.5 cm wide, ovate, apex subacute, margins entire, base tapering into a narrow, amplexicaul petiole less than 1.5 cm long, often dilated at the base to form stipule-like auricles. Flowers white, borne in elongated spikes up to 30 cm long; sepals green, up to 1.3 cm, persistent with membranous margins covered with stalked, globose crimson-tipped green glands; corolla tube less than 2.2 cm long, petals 6–7 mm long, obovate. Fruit (capsules) oblong, sharply pointed with 5 furrows, enclosed within the persistent, glandular calyx. Flowers and fruits year-round, but mainly between August and February in central India. The dried roots are reddish-brown in colour with a disagreeable odour.

Distribution and habitat

Native to the Old World tropics and found in the understorey of deciduous forests throughout peninsular India and West Bengal, particularly on rocky sites. It is cultivated in gardens throughout the country.

Medicinal properties and uses

In Ayurvedic and Unani medicine, the root is used to promote appetite and stimulate digestive processes, to treat diarrhoea and dyspepsia, and as a sudorific. It is considered useful for relieving anasarca, piles and intermittent fevers. In combination with other ingredients, the root is prescribed for dyspepsia, epilepsy and hysteria, haemorrhoids, nervous and rheumatic affections, obesity and prurigo. A paste of the roots prepared with milk, vinegar or salt and water is used as a vesicant and applied to promote healing of open abscesses and to treat rheumatism, leprosy and other skin diseases. An infusion of the root is given to treat spleen enlargement, and the root powder is used by women as an oral contraceptive among the tribal inhabitants of southern and eastern Bihar. A tincture of the root bark is a powerful sudorific and antiperiodic. It appears to possess abortifacient and vesicant properties similar to those of *Plumbago indica* though to a much

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milder degree; the root paste mixed with cow's milk is used to prevent conception by women in the Gandhamardan Hills of Orissa. Its milky juice is applied externally in the treatment of scabies and ulcers. Among the rural inhabitants of Bhavnagar District in Gujarat, the root is reportedly used to induce uterine contractions and abortion; its paste is used externally to treat leucoderma.

References

Bhatt *et al.* (1999), Brahmam and Saxena (1990), Chatterjee and Pakrashi (1995), Chopra *et al.* (1956), CSIR (1948–1992), Jha and Varma (1996), Kirtikar *et al.* (1935), Nadkarni (1954), Sivarajan and Balachandran (1994), Varma (1997).

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Poaceae

Bambusa bambos (L.) Voss

Botanical synonyms

Arundo bambos L., *Bambusa arundinacea* Retz. sensu J.A. & J.H. Schult., *B. orientalis* Nees, *B. spinosa* Roxb.

Common names

Bengali: bans, behar, behurbans, katausi; ***English***: spiny bamboo, thorny bamboo; ***Gujarati***: toncor, wans; ***Hindi***: bans, kanta bans, katang bans; ***Kannada***: andebidiru, bidungalu, dongi, habbidiru, hebbidiru, hebbidru; ***Konkani***: conoqui, kanaki, vellu; ***Malayalam***: illi, karmmaram, mulla, mungil; ***Marathi***: bambu, kallak, mandga; ***Oriya***: bendo, beudobaunso, kontabanso, kontobanso; ***Punjabi***: magae, magar bans, nal; ***Sanskrit***: bahupallava vansa, vansh; ***Tamil***: mullumungil, mungil, periya mungili, peru varaimungil; ***Telegu***: bongudu, bongu veduru, mullabongu, mullaveduru, mullavendru, pentiveduru, veduru; ***Urdu***: bansa.

Description

A graceful, spiny bamboo with short, stout, knotty rhizomes. Culms (stems) dense, up to 30 m tall and 5–10 cm in diameter, green, hollow, walls thick, purplish-green when young, turning golden yellow, with prominent nodes and long internodes up to 45 cm long, lower ones rooting, often sub-angular, flexuous; nodes armed with 2–3 stout recurved spines up to 2.5 cm long; stem sheaths coriaceous, variable in shape, up to 38 cm long and 30 cm wide, striate, apex rounded, orange-yellow streaked with red or green when young and covered with golden hairs. Leaves linear or linear-lanceolate, 7–18 cm long and 0.2–2 cm wide. Inflorescence an enormous panicle; branchlets bearing loose clusters of pale, suberect, lanceolate, acute, glabrous spikelets 1.3–2.5 cm long and 5 mm wide; floral

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glumes 3–7, the uppermost 1–3 male or neuter; seeds (grains or caryopses) oblong, 5–8 mm long, beaked by the style base, grooved on one side. Flowers gregariously once in 30–45 years.

Distribution and habitat

Found wild throughout peninsular India, Myanmar (Burma) and Sri Lanka to an altitude of 1250 m in moist localities such as along riverbanks and in valleys and ravines on rich alluvial soils. Very common in moist deciduous forests, sometimes forming dense thickets. Often cultivated in northern India in the Indo-Gangetic plains and sub-Himalayan tract and in the hills of Andhra Pradesh, Tamilnadu and Karnataka. Widely introduced and cultivated throughout the tropics.

Medicinal properties and uses

In Ayurveda the stems and leaves are reportedly used as a blood-purifier and to treat leucoderma and inflammatory conditions, and the sprouts to treat strangury; the seeds are considered alexiteric and aphrodisiac and are used to treat biliousness and urinary discharges, and the *manna* (siliceous deposits found in the hollow stalks) is used to treat blood diseases, tuberculosis, bronchitis, asthma, fevers, leprosy, jaundice, anaemia and strangury. In Unani, the burnt roots are reportedly used externally to relieve ringworm, bleeding gums and painful joints; the leaves are considered emmenagogue and are prescribed to relieve bronchitis, lumbago, piles, biliousness, gonorrhoea and fever; the juice of the flower is used as an eardrop to cure earache and deafness, and the *manna* is considered useful for treating biliousness, thirst, ophthalmia, fevers and stomatitis. A poultice prepared from the pounded young shoots is applied to infected ulcers to dislodge worms. An infusion of the leaves is used as an eyewash; given internally, it is used to treat bronchitis, gonorrhoea and fever. Both the grains and tender sprouts are eaten in some parts of India

References

Asolkar *et al.* (1992), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Ravisankar and Henry (1992), Yoganarasimhan (1996).

Bambusa vulgaris Schrader ex Wendl.

Botanical synonyms

Bambusa arundinacea Retz., *B. surinamensis* Ruprecht, *B. thouarsii* Kunth., *B. vulgaris* var. *taurica* Hook. f.

Common names

Bengali: basini bans; ***English***: golden bamboo, tiger bamboo; ***Marathi***: kalaka; ***Oriya***: sundrogai; ***Tamil***: mungil, ponmungil; ***Telegu***: vedru.

Description

A fast-growing, medium-sized bamboo 6–18 m tall and 5–10 cm in diameter. Culms bright green, yellow or striped green and yellow, polished; auricles of culm sheath present, prominent; middle culm joints 20–50 cm long. Leaves linear-lanceolate,

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15–25 cm long and up to 2 cm wide, margins rough, undersurface green. Inflorescences (spikelets) compressed, 6–10-flowered, borne in bracteate clusters.

Distribution and habitat

Believed to be native to tropical Asia but now cultivated throughout the tropics. It is found both wild and cultivated throughout tropical India to an altitude of 1500 m, thriving on riverbanks.

Medicinal properties and uses

The leaves are considered cooling and their decoction is given to treat fevers, coughs and sore throat; a paste of the leaves is used to promote healing of burns and wounds. The astringent bark is used to check haemorrhage, excessive menstruation, nausea and vomiting. The shoots and roots possess diuretic, diaphoretic and emollient properties; the fresh root, mixed with equal parts of tobacco (*Nicotiana tabacum*: *Solanaceae*) and betel (*Piper betle*: *Piperaceae*) leaves, is ground in oil and applied externally to relieve hard tumours. The young, bitter shoots are eaten as a cooked or pickled vegetable.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956), CSIR (1948–1992).

Chionachne koenigii (Spreng.) Thwaites

Botanical synonyms

Chionachne barbata (Roxb.) R. Br., *Coix barbata* Roxb., *C. koenigii* Spreng., *Polytoca barbata* Stapf

Common names

Bengali: gungar, gurgur, kesheghansa; ***Gujarati***: kansado; ***Hindi***: kansa; ***Kannada***: kajalu, suku dabha; ***Konkani***: kasada; ***Marathi***: kasai, varival; ***Sanskrit***: kanda; ***Telegu***: ghellagadi.

Description

A tall, robust, branching, monoecious perennial grass with culms 0.9–1.9 m tall and softly bearded nodes. Leaves linear, usually 15–30 cm long and 0.6–2.2 cm wide, apex acuminate, midrib stout, margins scabrid; leaf sheaths long, smooth or hairy; ligule a narrow ridge. Inflorescence a terminal pani-

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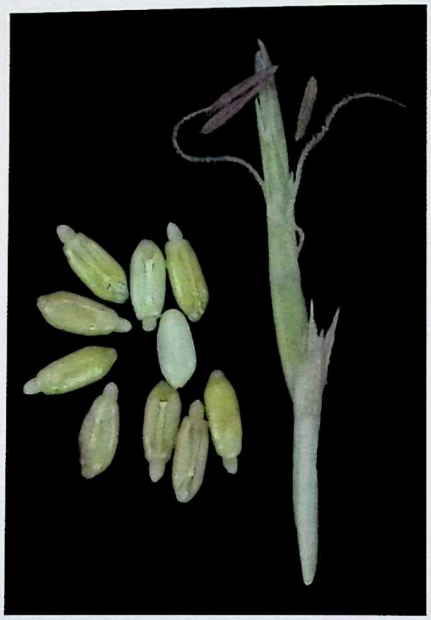
cle of racemose spikelets on slender peduncles, male at the top and female (1 or few) below: male spikelets 2-flowered, 0.7–1 cm long, female spikelets often solitary, glabrous, pale with keeled glumes, 0.4 cm long. Seed (grain or caryopsis) enveloped in thickened lower glume, 5–7 mm long.



Distribution and habitat

Found almost throughout India, more commonly in the east, and in Bangladesh, Myanmar (Burma), Sri Lanka and Java. Typically found in damp, sheltered habitats in savannahs, woodland borders, on grassy hillsides or near pools or marshes.

Medicinal properties and uses

In Ayurveda the plant is considered cooling, tonic, laxative and aphrodisiac. It is used for treating constipation, painful urination, headache, anorexia due to excess bile, haemorrhagic diathesis and diseases of the blood.

References

Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935).

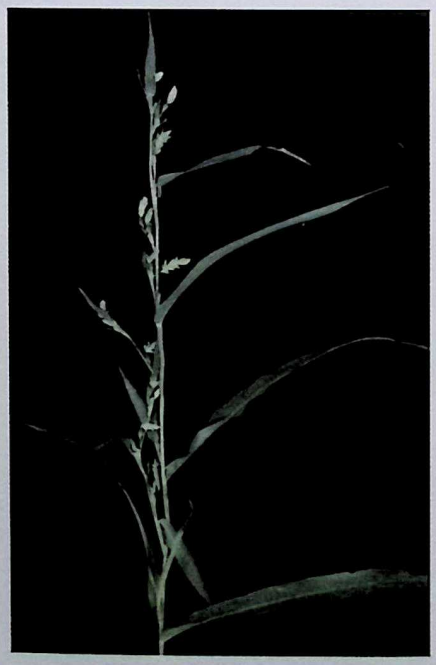
Coix lachryma-jobi L.

Botanical synonyms

Coix agrestis Lour., *C. lachryma* L.

Common names

Bengali: gurgur, kunch; ***English***: Job's tears; ***Gujarati***: kasai, ranzondlo; ***Hindi***: dabhir, ganduta, gurlu, sankru; ***Kannada***: kothi bija; ***Konkani***: ranzondlo, ranzonnalo; ***Marathi***: ranjondhala, ranmakkai; ***Punjabi***: sanklee, sanklu; ***Sanskrit***: gavedu, gavedhuka, jargadi; ***Tamil***: kattukunnetpavalam, netpavalam.



Description

A stout grass, much-branched, with culms 0.9–1.5 m tall, spreading below, rooting at the lower nodes, internodes smooth, polished. Leaves 10–50 cm long and 1.5–5 cm wide, narrowed from a broad cordate base to an acuminate tip, smooth on both sur-

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faces, margins spinulosely serrate; midrib stout; sheaths long, smooth; ligule a very narrow membrane. Flowers borne in 2.5–6.3-cm-long racemes, nodding or drooping from long peduncles; male racemes 1.5–4 cm long, erect, spikelets mostly paired, 0.7–1.3 cm long, imbricating, anthers 0.5 cm long, orange; female racemes enclosed within a beadlike auricle, which is white to green or bluish, globose, 0.6–1.2 cm long, hard. Flowers and fruits between September and October in central India.

Distribution and habitat

Widely distributed throughout tropical Asia, it is found both wild and cultivated in moist habitats throughout India from sea level to an altitude of about 2000 m. It is also cultivated in Africa and tropical America.

Medicinal properties and uses

The seeds have cathartic, tonic and diuretic properties; they are used to treat lung and chest affections and to prepare a drink for promoting weight loss. The roots are used to treat menstrual disorders. The plant and its juice are reportedly used to treat tumours and cancers. In Ayurveda the root is used to treat dysuria, thirst and vomiting.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956), Kirtikar *et al.* (1935), Nadkarni (1954), Yoganarasimhan (1996).

Cymbopogon citratus (DC.) Stapf

Botanical synonym

Andropogon citratus DC.

Common names

Bengali: gandhabena; ***English***: lemon grass, melissa grass; ***Gujarati***: lilacha, lilicha; ***Hindi***: gandhatrina; ***Kannada***: majjigehullu, purhalihulla; ***Malayalam***: shambharapulla, vasanappula, vasana pullu, vasanappillu; ***Marathi***: mirvacha, olancha; ***Punjabi***: khawi; ***Sanskrit***: bhustrina; ***Tamil***: karpurappillu, vasanappillu; ***Telegu***: chippagaddi, nimmagaddi, vasanagaddi.

Description

A tall perennial grass with dense fascicles of leaves arising from a short, oblique annulate rhizome. Leaves with an aromatic (lemony) odour when crushed; blades linear, long-attenuated towards the base and tapering upwards to a long point, up to 90 cm long and 1.6–1.8 cm wide, very firm, glaucous green; midrib whitish on upper side, primary lateral nerves 4–6 on each side, raised above; ligules very short, rounded or truncate; sheaths 10–30 cm long, glabrous and smooth, cinnamon-coloured or russet on the inside, those of the culms shorter than internodes, finely

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pubescent or velvety at the nodes. Flowers reddish, borne in loose panicles 30–60 cm long, sometimes larger, internodes *c.* 5–20 cm, decreasing in length from base to apex.

Distribution and habitat

Probably indigenous to India, but now known only in its cultivated state throughout the country. It is grown in many tropical countries for the aromatic oil distilled from its leaves.

Medicinal properties and uses

The grass is considered laxative, appetizer, alexipharmic, anaphrodisiac and anthelmintic; it is used in Ayurveda to treat bronchitis, leprosy and epileptic fits. An infusion of the leaves is used as a sudorific, stimulant, antiperiodic and for treating catarrh. The aromatic oil from the leaves is carminative and used to treat flatulence, gastric irritability and spasmodic affections of the bowels. It is applied externally as an embrocation to relieve chronic rheumatism, neuralgia, sprains and other pains, and as a mosquito repellent. In Siddha the leaf and its oil is used to treat pyrexia, distaste, stomach-ache, vomiting, arthritis and as a carminative and nervine stimulant.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956, 1969), Kirtikar *et al.* (1935), Nadkarni (1954), Yoganarasimhan (1996).

Cymbopogon martinii (Roxb.) Wats.

Botanical synonyms

Andropogon martinii Roxb., *A. schoenanthus* L. var. *martinii* Hook. f.

Common names

Bengali: gandhabena; ***English***: geranium grass, rosha grass; ***Hindi***: ghandh bel, gandhvel, merchya, mirciagandh, rosha, roshisha, rusa; ***Kannada***: anchet hullu, bili dodda, kachi hullu, kasi hullu, kunthi hullu, nanj hullu; ***Marathi***: rhus sugandhi; ***Sanskrit***: rohisa; ***Tamil***: kamakshapullu, kannam pillu, kavattan pillu; ***Telegu***: kachi gaddi, kamachi-kassuvu.

Description

A sweet-scented, tufted, erect, perennial grass 1–2 m tall. Leaves linear-lanceolate, 5–20 cm long, base amplexicaul or cordate. Flowers borne in spiked racemes, drooping with age, in yellow panicles turning reddish at maturity. Flowers and fruits from September to February in central India. Two varieties are recognized: var. *motia* (which yields *palmarosa* oil) and var. *sofia*.

Distribution and habitat

Widely distributed throughout the tropics. In India, it is found in the drier regions of

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the country, and is common in Maharashtra and Madhya Pradesh, and in southern India from sea level to 1500 m elevation.

Medicinal properties and uses

The essential oil distilled from the leaves (*rusa* oil) is used externally as a rubefacient to treat lumbago, rheumatism, stiff joints and skin diseases; it is also used in mosquito-repellent ointments. An infusion of the grass is considered carminative and stimulant; it is used to treat colic, bilious vomiting and dyspepsia. The aerial parts of the plant, ground in water, are used as a body rub to relieve fever among the tribal inhabitants of Madhya Pradesh.

References

Asolkar *et al.* (1992), Brahmam and Saxena (1990), Chopra *et al.* (1956, 1969), Nadkarni (1954), Shah and Singh (1990), Yoganarasimhan (1996).

Cynodon dactylon (L.) Pers.

Botanical synonyms

Agrostis linearis Retz., *Cynodon linearis* Willd., *Panicum dactylon* L.

Common names

Bengali: dubh, dubla, durba; ***English***: Bahama grass, Bermuda grass, hariali grass; ***Gujarati***: dhro, dhrokad, durva, gharo; ***Hindi***: dhoboghas, dhub, hariali; ***Kannada***: garike hullu, karkeri hullu, kudi garikai; ***Konkani***: dhurva, harialy, karuka; ***Malayalam***: karuka, karukappullu; ***Marathi***: dhurva, durva, haryali, karala; ***Oriya***: dubbula ghanso; ***Punjabi***: dubra, harialy, karala; ***Sanskrit***: dhurva, durva, haritali; ***Tamil***: arugampul, arugampillu, arugampullu, hariali; ***Telegu***: gericha gaddi, gurka hariali, harvali; ***Urdu***: dub.

Description

An extensively creeping perennial grass with strong, flat rhizomes and stolons and

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slender, erect or ascending, flowering branches up to 30 cm tall. Leaves distichous, narrowly linear or lanceolate, glaucous, 2–10 cm long and 1.2–1 mm wide; sheaths tight, glabrous or hairy; ligule a ring of white hairs. Flowers borne on 2–6 green or purplish spikes 2.5–5 cm long, radiating from the top of a slender peduncle 2–5 cm long; spikelets 1.7–2.5 mm long; involucral glumes lanceolate, acute, the lower 1–1.6 mm long, the upper slightly longer; floral glume obliquely oblong to semiovate, *c.* 2 mm long. Flowers and fruits from July to January in central India.

Distribution and habitat

Cosmopolitan in distribution and common in open, moist and wet habitats throughout India to an altitude of 2500 m in the Himalayas and 2100 m in the Western Ghats. Particularly common on well-drained, sandy-loam soils.

Medicinal properties and uses

In Ayurveda the whole herb is considered cooling, astringent, demulcent, diuretic, ophthalmic, haemostatic and suppurative. The juice of the fresh plant is considered astringent and is used to promote healing of fresh cuts and wounds, and is taken internally to treat cases of chronic diarrhoea and dysentery. It is also diuretic, and used to treat dropsy and anasarca, and is considered useful for hysteria, epilepsy and insanity. An infusion of the plant is used by rural and tribal inhabitants of Bhavnagar District in Gujarat as a remedy for bleeding piles, menorrhagia, erysipelas and dysuria. The rhizome is used to treat genito-urinary disorders. Its decoction is used as a diuretic in the treatment of dropsy by the Mundas, and in Karnataka it is used to treat secondary syphilis. A cold infusion of the roots is used to treat bleeding piles. The crushed roots, mixed with yoghurt, are used in the treatment of chronic gleet.

References

Asolkar *et al.* (1992), Bhatt and Mitaliya (1999), Chopra *et al.* (1956), Kirtikar *et al.* (1935), Sivarajan and Balachandran (1994), Yoganarasimhan (1996).

Dactyloctenium aegyptium (L.) Beauv.

Botanical synonyms

Cynosaurus aegypticus L., *Eleusine aegyptiaca* (L.) Desf.

Common names

Hindi: makra, makri; ***Kannada***: kaduragihullu; ***Malayalam***: kavarapullu; ***Marathi***: mhar; ***Oriya***: kakuriya; ***Punjabi***: bhobra, chimbari, karmadhana, madhana; ***Sanskrit***: markatatrna, takrahva, timira; ***Tamil***: sodi, tamida; ***Telegu***: muttengapillu.

Description

An annual, very variable, grass with erect or creeping culms 10–44 cm high, rooting from the profusely branched nodes. Leaves linear, tapering to a fine point 2–10 cm long and 0.2–0.4 cm wide, flat, glaucous, glabrous or hispid; leaf sheaths striate, the lower whitish; ligules membranous, very short. Inflorescence comprised of 2–6 digitate spikes 0.5–4 cm long, olive-grey; spikelets 2–5 flowered, spreading at right angles, pendulous, strongly striate. Glumes somewhat dissimilar; lower *c.* 0.7–2 mm long, ovate with winged keel, upper *c.* 1.5 mm long, obovate with 1.6–2-mm-long awn. Grain 0.5–1 mm long, subglobose, reddish, very rugose.

Distribution and habitat

Widely distributed in the Old World tropics and introduced to the Americas. Common throughout the plains of tropical and subtropical India to an altitude of

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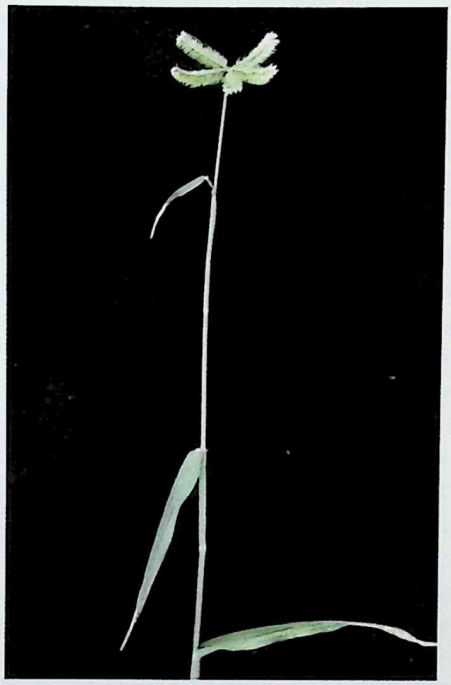
1500 m in the hills as a weed in cultivated fields and other open habitats.



Medicinal properties and uses

The whole plant is used in Ayurvedic practice to treat worm infestation and wounds. In Chota Nagpur the parched grains are reportedly eaten in small doses for 3–8 days by women after childbirth to relieve abdominal pains. In Africa, a decoction of the seeds is reportedly used to relieve kidney pain, and the herbaceous parts of the plant are applied externally to promote the healing of ulcers.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

Dendrocalamus strictus (Roxb.) Nees

Botanical synonyms

Bambos stricta Roxb., *Bambusa stricta* Roxb.

Common names

Bengali: karail; ***English***: male bamboo, solid bamboo; ***Gujarati***: nakorvans, narvans, vans; ***Hindi***: bans, banskaban, banskhurd, kantwasi, narbans; ***Kannada***: bidiru, gandhubediru, kibbidary, kiribidru; ***Malayalam***: arinkatam, cheriyamula, kalmula, kalmungil, karinalimula, karinkana; ***Marathi***: bans, bharivel, bhariyel, bhovarlit, velu; ***Oriya***: salia bhanso, salimbobaunso, salimbobhanso, sanobaunso; ***Sanskrit***: vanshavenu, yavaphala; ***Tamil***: kalmungil, kattumungil, mungil, sinnamungil, sirumungil; ***Telegu***: kankaveduru, penveduru, sadanapaveduru, veduru.

Description

A deciduous, densely tufted bamboo with strong, elastic, thick-walled stems (culms) varying in size depending on locality. Stems glaucous green when young to dull green or yellowish when old, usually 6–15 m tall and 2.5–7.5 cm in diameter, somewhat

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swollen at the nodes, bearing leafy branches from the base under open conditions; upper branches curved and drooping; internodes 30–45 cm long. Stem sheaths variable, the lower 7.5–30 cm long, striate, outer surface covered with stiff golden brown hairs, or sometimes smooth in dry localities. Leaves usually 2.5–5 cm long in dry regions, up to 25 cm long in moist ones, 0.6–3.2 cm wide, base rounded into a short petiole, narrowed upwards into an acuminate twisted apex, rough above, softly hairy beneath; nerves 3–6 pairs with pellucid glands; leaf sheaths striate, hairy; ligule narrow, serrate. Inflorescence a large branching panicle of dense globular heads about 2.5 cm in diameter, 3.8–5 cm apart; spikelets usually hairy, spiny, the fertile intermixed with many smaller sterile ones, 8–13 mm long and 2.5–5 mm wide, with 2–3 fertile florets. Grains ovoid to subglobose, 8 mm long, brown, shining, hairy above, similar in form but half the size of unhusked wheat. Flowering irregular and sporadic, usually from November to February, sometimes gregarious over large areas; seeds ripen and fall from April to June.

Distribution and habitat

Thought to be native originally to India and Myanmar (Burma), now widely introduced throughout the tropics. Found on moist sites such as along streams and on lower hill slopes in deciduous forests and in dry or moderately dry regions throughout India to an altitude of about 1100 m. It often grows gregariously and thrives on porous, gravelly or sandy soils.

Medicinal properties and uses

The siliceous matter found near the joints is reportedly used as a cooling, tonic and astringent medicine. The Bondos of southern Orissa apply the scraped epidermis of the stems to promote healing of cuts. The juice expressed from the warmed, tender stems is used as an eardrop to relieve earache among the Gonds of Uttar Pradesh.

References

Aminuddin and Girach (1991), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Singh and Prakash (1994).

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Hackelochloa granularis (L.) Kuntze

Botanical synonyms

Cenchrus granularis L., *Manisuris granularis* (L.) L. f.

Common names

Gujarati: kasium, kasiunghas; ***Hindi***: kangni, trinpali; ***Kannada***: kadu sanna harka hullu; ***Sanskrit***: palanggini, phalangini; ***Telegu***: guru singu gaddi, kurujedanai gaddi.

Description

A slender, erect tufted grass with branching culms up to 1 m tall; nodes hairy. Leaves flat, 2.5–20 cm long and 0.4–1.2 cm wide, linear-lanceolate, apex acute or acuminate, base cordate, hairy on both surfaces; leaf sheaths much shorter than internodes, hispid; ligule very short, membranous, densely ciliate. Inflorescences (racemes) 0.6–2.5 cm long, comprising numerous subglobose spikelets about 1–2 mm long resembling a string of minute beads, solitary or clustered in leaf axils.

Distribution and habitat

Pantropical in distribution; found throughout tropical and subtropical India to an altitude of about 1200 m.

Medicinal properties and uses

The plant is reportedly taken internally in conjunction with a little sweet oil to treat enlarged spleen and liver.

References

Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

Heteropogon contortus (L.) Roem. & Schult.

Botanical synonym

Andropogon contortus L.

Common names

Bengali: kher; ***English***: spear grass; ***Gujarati***: dabhjuliyun; ***Hindi***: kher, kumeria, parwa, sarol, shurval, shurighas, shurval, sura; ***Kannada***: kari vunugada hullu, oobina hallu, sankari hullu; ***Marathi***: gantegawta, kantegawta; ***Oriya***: dauria, sinkola; ***Punjabi***: sarwal, suryala; ***Tamil***: karunsi pullu, oosi pullu, pani pullu; ***Telegu***: dubba gasari gaddi, eddi gaddi, pandi bella gaddi, kaseri gaddi, yerragoyi.

Description

A densely tufted, gregarious, perennial grass; stems slender, erect or decumbent below, 30–150 cm long, leafy at the base. Leaf blades flat, linear, rigid, 4–30 cm long and 0.2–0.5 cm wide, apex shortly acuminate, sparsely ciliate towards the base; basal sheaths laterally compressed, keeled, glabrous; ligule short, truncate. Flowers

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borne in terminal, solitary, spiked racemes 3–7.5 cm long, the awns forming a twisted spire at the top; spikelets sessile, 0.5–0.8 cm long including the callus, closely imbricating, lower ones awnless, male or neuter, upper ones female, long-awned, bearded with reddish-brown hairs. The species is very variable in its growth habit, size and colour of leaves, and degree of pubescence of the inflorescence. Flowers from August to December and the grains ripen between October and January.

Distribution and habitat

Found throughout the tropics and subtropics and in the Mediterranean region, it occurs in dry habitats throughout India on all soil types to an elevation of about 2300 m in the Himalayas and the Western Ghats. It is one of the chief pasture grasses in the hills of northern India and in the subcoastal regions of Queensland, Australia.

Medicinal properties and uses

The root is considered stimulant and diuretic and is reportedly used to treat rheumatism. The plant is reportedly used to treat toothache, fever, atrophy, emaciation or cachexy, muscular pain, haematuria and dysentery. The oil distilled from the awns is given to relieve asthma.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

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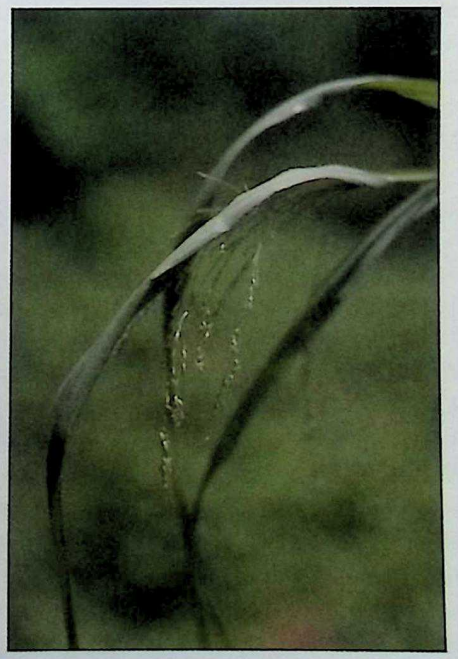
Panicum antidotale Retz.

Common names

English: blue panic; ***Gujarati***: dhusdo, dhusghas, dun, dusto; ***Hindi***: ghemor, gunara, jamur; ***Kannada***: peenasi hullu; ***Punjabi***: baru, ghamur, gharam, ghirri, mangrur; ***Tamil***: nassiam pillu, pinisu pillu.

Description

A tall, coarse perennial grass with a thick, creeping rootstock, smooth woody stems up to 2 m tall, and solid, woody internodes. Leaf blades 10–60 cm long and 0.4–2 cm wide, linear, finely acuminate with capillary tips; leaf sheaths long, glabrous, striate; ligule short, membranous. Inflorescence (panicles) 10–45 cm long, pyramidal, rachis very slender, branches usually fascicled, 7.5–10 cm long, spreading and drooping; spikelets crowded on the branchlets, 2.8–3.5 mm long and 1–1.2 mm wide, elliptic-lanceolate to ovoid, acute, glabrous, purplish, comprised of 4 broadly ovate glumes.



Distribution and habitat

Believed to be native to Asia from Iran to India; widely introduced in all tropical and subtropical regions as a forage grass, sand binder and medicinal plant. In India it is common from Punjab, Kashmir and the upper Gangetic plain southwards through the western and southern Deccan peninsula to Tamilnadu.

Medicinal properties and uses

The smoke of the burning plant is reportedly used for fumigating wounds and as a disinfectant in smallpox. The plant is said to be used for treating throat infections in southern India, and as an antidote in hydrophobia.

References

Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

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Pennisetum americanum (L.) Leeke

Botanical synonyms

Alopercus typhoides Burm. f., *Holcus spicatus* L., *Panicum americanum* L., *P. glaucum* L., *Penicillaria cylindrica* Roem. & Schult., *Pennisetum glaucum* (L.) Br., *P. spicatum* (L.) Koern., *P. typhoideum* Rich., *P. typhoides* (Burm. f.) Stapf & C.E. Hubb.

Common names

Bengali: bajra, lahra; ***English***: bulrush millet, pearl millet, spiked millet; ***Gujarati***: bajri; ***Hindi***: bajra, lahra; ***Kannada***: sajjai, sajje; ***Malayalam***: kampam, mattari; ***Marathi***: bajri; ***Oriya***: bajramula, gantiya; ***Punjabi***: bajra, bajza; ***Sanskrit***: agradhanya, nali, sajaka, varjarika; ***Tamil***: kambu; ***Telegu***: gantelu, ganti, peddaganti, sajja, sajjalu, sazza.

Description

A tall, erect annual with slender or stout stems, 0.3–3 m high, simple or branched, sometimes with conspicuous prop roots from the lowest nodes; internodes solid, grooved; sheaths rounded, usually glabrous, margin ciliate, collar pubescent or glabrous; ligule 2.5–7 mm long, the membrane 0.2–1.2 mm long, the cilia 1.5–6 mm long. Leaf blades lanceolate, 30–150 cm long and 0.5–7 cm wide, linear to linear-lanceolate from a rounded base, flat, more or less rough, glabrous, apex acute. Inflorescence (panicle, or earhead) spike-like, generally 2–20 cm long and 0.5–6 cm broad, compact, cylindrical, greenish-yellow with a pinkish tinge turning pale brown or purplish when mature, closely packed with spikelets and bristles; branchlets reduced to clusters of 1–8 spikelets. Grains oblong, obovoid or pyriform, variable in colour from white or pale grey to yellow or light blue in colour.

Distribution and habitat

Probably native to Africa, but widely introduced as a grain and forage crop in tropical and warm-temperate areas. Numerous strains, differing in the size and shape of their earheads, are cultivated throughout the drier regions of India, including the western and southern Deccan peninsula to an elevation of about 2150 m. It is the fourth most extensively planted crop in India after rice, wheat and sorghum (*jowar*).

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Medicinal properties and uses

In Ayurvedic medicine the grains are considered tonic, heating, and aphrodisiac in women, useful for treating heart diseases, and as an appetizer. In Siddha the grains are regarded as cooling and tonic and are used to relieve piles. In Unani medicine the plant is considered styptic and useful for treating inflammations and liver diseases.

References

Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

Saccharum spontaneum L.

Common names

Bengali: kagara, kas, kash, kashiya, khagra; ***English***: thatch grass, wild sugar cane; ***Gujarati***: kans, kansado, kansadoghas; ***Hindi***: kagara, kans, kansi, kas, kosa, kus; ***Kannada***: darbhe, hodakehullu, mutullahullu; ***Malayalam***: kusha, nannana; ***Marathi***: kagara, kasara; ***Oriya***: chhatiagaso, inkoro, kaso, khhodi; ***Punjabi***: kahi; ***Sanskrit***: kasa, kasah, kasalu, kasha; ***Tamil***: kosangan, kurbagam, nanal, nanarbul, nanmugappul; ***Telegu***: kakicheraku, rullugaddi.

Description

A tall, erect perennial grass, usually 0.6–1.7 m tall (occasionally to 5 m tall) with aggressive rhizomatous tillering. Stems slender, solid, smooth, polished, 0.8–1.5 cm in diameter, green, grey or ivory-white; internodes usually long. Leaves narrowly linear, 30–75 cm long and 0.3–0.6 cm wide, apex finely acuminate, rigid, coriaceous, sharp-edged; leaf sheaths to 20 cm long, glabrous; ligule ovate, membranous. Inflorescence (panicles) 20–60 cm long, lanceolate, rachis slender; branchlets 5–10 cm long with very fine rachises, silky white to purplish-grey, composed of paired spikelets 0.4 cm long, one pedicelled and the other sessile; glumes lanceolate, ciliate, always 4 per spikelet. Grains oblong to subglobose.

Distribution and habitat

Distributed widely in subtropical and tropical Asia from Turkmenistan and Iran southeastwards through South and Southeast Asia to New Guinea and the adjacent Melanesian and Micronesian islands, in northern and eastern Africa, and in southern Europe; introduced and naturalized in Panama. In India it is found throughout the country to an altitude of 1800 m in the Himalayas, in open or disturbed habitats such as cultivated fields, usually near water and often forming continuous cane-brakes.

Medicinal properties and uses

The plant is considered laxative and aphrodisiac. A paste prepared from the root, mixed with black pepper, is applied to relieve hydrocele among the Kondhs of southwestern Orissa. In Ayurveda the root is used to treat urinary disorders, wasting diseases, diarrhoea, haemorrhagic diathesis,

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urinary calculi, eye diseases and burning sensations. In Siddha the whole plant and root are used to treat vomiting, mental diseases, abdominal disorders, dyspnoea, anaemia and obesity.

References

Chopra *et al.* (1956), CSIR (1948–1992), Girach (1992), Kirtikar *et al.* (1935), Sivarajan and Balachandran (1994), Yoganarasimhan (1996).

Zea mays L.

Common names

Bengali: bhutta, janar, jonar; ***English***: corn, Indian corn, maize; ***Gujarati***: makkai, makkari; ***Hindi***: bara-jowar, bhutta, junri, kukri, makai, makka; ***Kannada***: goinjol, makkai, jola, mekkejola, musukojola; ***Konkani***: maeo, zonallo, zondlo; ***Malayalam***: cholam, makka cholam; ***Marathi***: buta, maka, makai; ***Oriya***: buta, maka, mokka; ***Punjabi***: barajaur, chhale, juar, kukri, kuthi, makai; ***Sanskrit***: yavanala; ***Tamil***: makkacholam, turakacholam; ***Telegu***: mokkajanna, makkajonnalu, makkajounalu; ***Urdu***: makai.

Description

A robust, monoecious annual grass varying in height from 0.5 to 6 m among its many varieties and regional types. Stems or stalks smooth, developing adventitious fibrous roots from the lower nodes. Leaves with overlapping sheaths, a short ciliate ligule and broadly lanceolate blade, 30–125 cm long and 2–12 cm wide, hairy above, ciliate on the margins. Male flowers borne in numerous long spike-like racemes comprised of 2-flowered paired awnless spikelets, forming large panicles ('tassels'). Female inflorescence axillary, comprised of 8–16 (or more) rows or spikelets on a thickened, almost woody axis ('cob'), the whole structure enclosed in numerous, large leafy bracts or spathes ('husk cover') with the long, silky styles protruding from the summit; spikelets half sunk in axis, conical. Grains large, subglobose, shining and hard when ripe, surrounded by the base of the glumes.

Distribution and habitat

The centre of origin is considered to be either southern Mexico and Central America, where it was first domesticated at least 7000 years ago, or in the Andean region of Bolivia, Ecuador and Peru. It was introduced to India at an unknown date, either from Central or South America long before the era of Arab and European colonial trade (based on the discovery of primitive varieties found in the northeastern Himalayas), from Africa through Arab traders during the past 1000 years or, at the latest, in the early 16th century by Portuguese explorers and traders. Today maize is cultivated as a nutritious food grain, a source of edible oil and livestock fodder throughout India and in almost all other tropical, subtropical and temperate countries having a warm growing season.

Medicinal properties and uses

Maize silk (styles) is considered astringent, diuretic and chloretic; it is used in various

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forms in many parts of the world for treating bladder ailments. The grains are considered resolvent and astringent, and are recommended as a suitable diet for patients with consumption. In the Konkan (Maharashtra) an alkaline solution prepared from the burnt cobs is used to treat lithiasis. In Ayurveda the grains are used as a diuretic and for treating haemorrhage. In Siddha they are also used as a diuretic and for treating dysuria, cough and diphtheria. In Unani a decoction of the grain is used as a hip-bath to relieve piles.

References

Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

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Polygalaceae

Polygala chinensis L.

Botanical synonyms

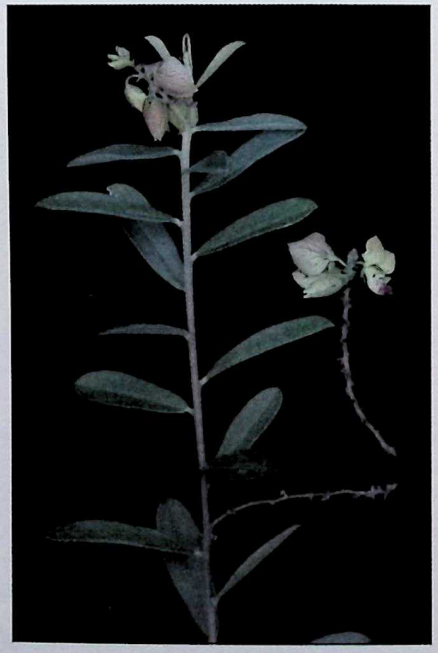
Polygala arvensis Willd., *P. brachystachya* DC. non Blume, *P. rothiana* Wight & Arn., *P. telephioides* Willd., *P. tranquebaria* Mart.

Common names

Bengali: meradu, miragu; ***English***: common Indian milkwort; ***Gujarati***: pilibhonyasana; ***Hindi***: meradu, miragu; ***Marathi***: negli, phuntani.

Description

A highly variable prostrate or erect annual herb, often multi-stemmed, up to 30 cm tall. Rootstocks slender; stem angular at the top. Leaves generally 1.2–2 cm long and 0.4–0.6 cm wide, varying from oblong-ovate to lanceolate, base attenuate, apex mucronate, apiculate, margins smooth and hirsute; petioles short, up to 0.2 cm long; bracts persistent. Flowers yellowish, fading to pink or bluish-violet, in axillary or extra-axillary racemes, shorter than the leaves. Fruits (capsules) obcordate, *c.* 3 mm long and broad, margin ciliate, apex emarginate, cleft deep; seeds obovate, to 3 mm long and 1.2 mm broad, brown, covered with silvery hairs, 3-winged.



Distribution and habitat

Native to tropical Asia and Australia. Found throughout India to an elevation of approximately 1500 m, and in the Nicobar Islands.

Medicinal properties and uses

An infusion of the leaves is prescribed for asthma, chronic bronchitis and catarrhal

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affections. The roots are reported to possess antiseptic properties, and are used by residents of Chota Nagpur to relieve fever and dizziness.

References

Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935).

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Pontederiaceae

Eichhornia crassipes (Mart.) Solms.-Laub.

Common names

Bengali: kachuri pana; ***English***: water hyacinth; ***Kannada***: antara taavare; ***Malayalam***: kalavazha; ***Sanskrit***: jalakumbhi, variparni; ***Tamil***: akasa thamarai; ***Telegu***: pisachithamara.

Description

A free-floating or partly rooting perennial aquatic herb with numerous, long, fibrous roots, short leafy stem and showy flowers. Leaves in rosettes, spoon- or paddle-shaped, apex rounded, 5–20 cm wide; petioles turbinately swollen and spongy, enabling the plant to float. Flowers mauve, lilac or blue, funnel-shaped, 2.5–3.8 cm long. Fruit (capsule) many-seeded.

Distribution and habitat

Native to tropical South America, introduced to India as an ornamental plant in the early 20th century and now naturalized throughout the country. It is an aggressive, often problematic, weed that typically forms dense, often very thick, mats on lakes, reservoirs and slow-moving waters. Also found in many other tropical, subtropical and warm temperate regions outside its original native range.

Medicinal properties and uses

In Ayurveda, the whole plant is used as a substitute for *Pistia stratioites* (*Araceae*) to treat blood disorders and emaciation; the plant juice is reportedly taken internally for treating goitre in combination with a poultice prepared from the crushed plant.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956), CSIR (1948–1992), Yoganarasimhan (1996).

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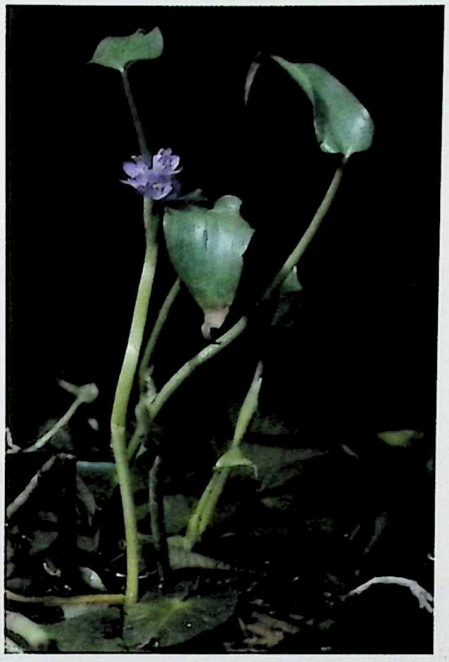
Monochoria vaginalis (Burm. f.) Presl. ex Kunth.



Botanical synonyms

Monochoria plantaginea (Roxb.) Solms., *Pontederia vaginalis* Burm. f.

Common names

Bengali: nanka, nukha; ***Malayalam***: kakapola; ***Sanskrit***: indivarah; ***Telegu***: nirkancha, nirokancha.

Description

An aquatic herb with a short, suberect, spongy rootstock. Leaves long-petioled, variable in shape from linear to ovate or ovate-cordate, 5–10 cm long and 3.2–5 cm wide, apex usually acuminate. Flowers blue, usually spotted with red, borne in racemes. Fruits (capsule) ellipsoid, up to 1.3 cm long, glandular outside; seeds minute, ellipsoid, with many brown ribs.

Distribution and habitat

Found in rice fields, ditches and on margins of water reservoirs and pools, marshes and swamps almost throughout India up to an altitude of 1500 m. Also found in tropical Africa and elsewhere in tropical Asia from Pakistan to Japan, the Philippines and Malaysia.

Medicinal properties and uses

The root is chewed to relieve toothache, and the root bark is eaten with sugar for asthma. The paste of the tuber is reportedly used externally as an antidote to snake-bite poisoning among the Kadars in the Anamalai Hills of Tamilnadu. In Java the juice of the roots is taken to treat stomach and liver disorders, while that of the leaves is used to relieve coughs. In Siddha, the root (tuber) is used to treat cough, venereal diseases, fever and fainting. The entire plant, excluding the roots, is eaten as a vegetable.

References

Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Rajendran and Henry (1994), Yoganarasimhan (1996).

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Portulacaceae

Portulaca oleracea L.

Common names

Bengali: baraloniya; ***English:*** common purslane, garden purselane; ***Gujarati:*** ghol, loni, mhotiluni; ***Hindi:*** baralaniya, khursa, kulfa; ***Kannada:*** dooddagooni soppu, duda-gorai; ***Konkani:*** gol, golchibagi; ***Malayalam:*** koricchira; ***Marathi:*** bhuigholi, kurfah, mhotighol, pasalai; ***Oriya:*** purunisag; ***Punjabi:*** lonak, dhami (seeds); ***Sanskrit:*** brhalloni, ghotika, loni, lonika, lunia; ***Tamil:*** karikeerai, parpukire, parukire, paruppukiray, pullikirai; ***Telegu:*** ganga-pavilikura, pappukura, peddapavila kura, peddapayilikura; ***Urdu:*** khurfah.

Description

A succulent, prostrate or erect annual, with green or purple stems swollen at the nodes, up to 50 cm long. Leaves fleshy, 0.6–4 cm long and 1.5–2 cm wide, alternate or sub-opposite, oblong-ovate, subsessile, spathulate or linear with reddish margins and glistening dots when fresh, apex rounded and truncate, base cuneate. Flowers bright yellow, 2–6 in terminal or axillary clusters; sepals unequal, obtuse, petals 5, obovate. Fruit (capsule) ovoid, 0.3 cm long, dehiscing above the base; seeds numerous, reniform, black, concentrically striate and granulate, 0.6–0.7 mm across. The carinate-alate calyx lobes distinguish this species from its allies. Two varieties are distinguished, the common wild variety (var.

olearcea, syn. *P. oleracea* var. *sylvestris* DC.) and the cultivated variety, var. *sativa* DC (*kitchen garden purslane*); the latter is more upright and is considered better in quality and yield. Flowers and fruits during the winter, or between October and December in central India.

Distribution and habitat

Pantropical in distribution, it is found throughout India as a common weed in open, disturbed habitats such as vacant lots, fields, gardens and sandy riverbeds, to an elevation of 1500 m; sometimes cultivated as a vegetable.

Medicinal properties and uses

The herb is considered to possess cooling, alterative, antiscorbutic, aperient and diuretic properties, the diuretic property

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probably due to its high content of potassium salts. It is eaten as a cooked vegetable for the treatment of scurvy and diseases of the liver, spleen, kidney and bladder. It is prescribed in the treatment of cardiovascular diseases, dysuria, haematuria, gonorrhoea, dysentery, sore nipples and ulcers of the mouth. The fresh leaf-juice is considered an effective thirst-quencher. The juice of the plant is sometimes used to treat earache and toothache. A paste of the leaves is used to sooth burns, scalds, swellings and erysipelas. The leaves and tops are used in anti-haemorrhagic poultices. The stem-juice is applied externally to relieve prickly heat and to the hands and feet when a burning sensation is felt. The seeds are demulcent, diuretic, antidysenteric, anthelmintic and antidiarrhoeal.

References

Chatterjee and Pakrashi (1991), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935), Nadkarni (1954), Sivarajan and Balachandran (1994).

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Ranunculaceae

Clematis triloba Heyne ex Roth

Common names

Bengali: laghukarni, moravela; ***Gujarati***: morvel, ranjai, trekhado-velo; ***Hindi***: churahar, dhantiali, moravela, murhari; ***Kannada***: morhari; ***Marathi***: moravela, murhari, ranjai, ranjani; ***Sanskrit***: murva.

Description

A climbing shrub with all parts tomentose except old stems. Leaves simple or once ternate, entire or shallowly 1–7-lobed; blades 2.5–5.1 cm long, from ovate-acute to orbicular, base rounded, cuneate or cordate; petioles slender, twining, 2–7.5 cm long. Flowers white, fragrant, 3.8–5.1 cm across, borne in many-flowered axillary and terminal panicles with leafy lower bracts; sepals 4–6, pubescent (silky) outside, usually oblong, cuspidate. Fruit an ovoid head of sessile or stalked achenes with feathery tails, which bursts on maturity to release seeds. Flowers between September and November, and fruits from October to January in central India.

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Distribution and habitat

Commonly found in the western regions of peninsular India from Madyha Pradesh southwards.

Medicinal properties and uses

The leaves are considered alterative, acrid and sedative. In Ayurveda the plant is used internally to treat thirst, heart troubles and bilious vomiting, and as an external application for relieving boils, itching, and to kill parasitic worms. The fresh leaf-juice is applied to boils and itches, and used for the treatment of leprosy, blood diseases and chronic fever. The leaf-juice mixed with that of *Holarrhena antidysenterica* (*Apocynaceae*) is reportedly used as an eyedrop to relieve conjunctivitis.

References

Chatterjee and Pakrashi (1991), Chopra *et al.* (1956), Kirtikar *et al.* (1935), Nadkarni (1954).

Nigella sativa L.

Botanical synonym

Nigella indica Roxb. ex Flem.

Common names

Bengali: kalijira, kalzira, mungrela; ***English***: black cumin, nigella, small fennel; ***Gujarati***: kalonjijiram; ***Hindi***: kalajira, kalonji, kulanji, mugrela; ***Kannada***: karejirage, karijirigi, karimsiragam; ***Konkani***: karijiry; ***Malayalam***: karunchiragam; ***Marathi***: krishnajira; ***Sanskrit***: upakuncika; ***Tamil***: karunjiragam; ***Telegu***: nellajilakaira.

Description

An attractive herb 30–60 cm high. Leaves 2–3-pinnatisect, 2.5–5 cm long, cut into linear or linear-lanceolate segments. Flowers pale blue, 2–2.5 cm across, borne on solitary long peduncles, sepals ovate, acute, clawed. Carpels 5–7, inflated, warty on the sides, united to the top. Seeds trigonous, black, rugulose-tubercular.

Distribution and habitat

Native to the Middle East; occasionally cultivated and naturalized in northern and north-central India.

Medicinal properties and uses

The seeds are considered carminative, stimulant, diuretic, emmenagogue and galactagogue; they are used as an adjunct to purgative remedies in Ayurvedic and Unani medicine. They are reportedly useful in the treatment of mild cases of puerperal fever. The powdered seeds, mixed with sesamum oil, are applied externally for eruptions of the skin, and to relieve scorpion sting. The seeds are also used as a flavouring material.

References

Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935), Nadkarni (1954).

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Rhamnaceae

Ventilago denticulata Willd.

Botanical synonyms

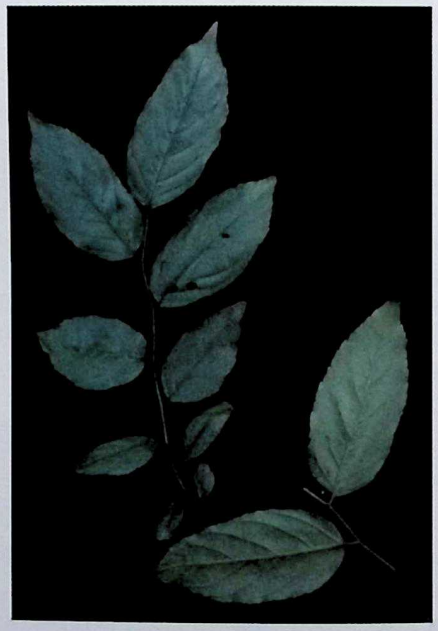
Ventilago calyculata Tulasne, *V. madraspatana* Gaertn. var. *calyculata* (Tulasne) King

Common names

Bengali: ruktapita; ***Hindi***: pitti, raidhani; ***Kannada***: gapsandiballi, harugasuratichekka, kuriyadi, surati chakke; ***Marathi***: sakalyel; ***Oriya***: pittoli; ***Sanskrit***: raktavalli; ***Telegu***: errashiratalatige, suratchekka, suratichekka, verrachictali.

Description

A large, climbing, evergreen shrub with strong, woody tendrils; bark dark brown or grey, fissured, inner bark fibrous, pinkish; twigs greenish, smooth, deeply striate, pubescent when young. Leaves 5–10 cm long and 2.5–6.3 cm wide, ovate-oblong to elliptic-oblong, base obliquely acute or rounded, apex usually acuminate, margins entire or irregularly crenate-serrate; petioles 5–10 mm long. Flowers 3.8–5 mm in diameter, pale yellowish-green, with an offensive fetid odour, borne in clusters on large, spreading, terminal pubescent panicles to 23 cm long. Fruit a yellow, subglobose nut 5 mm in diameter, enclosed in a persistent calyx rim to about the middle and prolonged into a linear pubescent wing 3.8–5 cm long and 0.7–1 cm wide; seeds 1, rounded.



Distribution and habitat

Native to tropical Asia from India and Sri Lanka eastwards through Myanmar (Burma), Indochina, Thailand, Malaysia and Java. In India it is found in dry deciduous forests from the Himalayan range southwards.

Medicinal properties and uses

The powdered stem bark is applied externally to relieve sprains, and the sap is used for treating deafness. The juice of the bark

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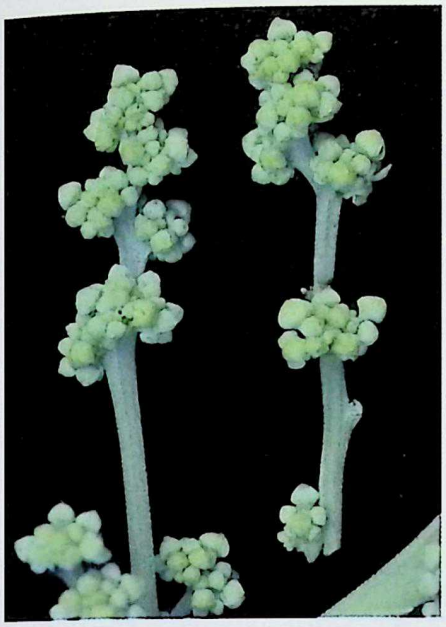

and young shoots is applied to the body as a remedy for pains associated with malarial fever by the tribal inhabitants of Chota Nagpur. In Prakasam District in southern Andhra Pradesh the juice obtained from the root bark is given orally to treat stomach-ache, a paste of the fresh leaves is used externally to treat sprains, and a decoction of the stem bark is given to treat diarrhoea and dysentery.

References

Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Vijaya Kumar and Pullaiah (1998), Yoganarasimhan (1996).

Ventilago madraspatana Gaertn.

Botanical synonym

Ventilago madraspatana Gaertn. var. *madraspatana*

Common names

Bengali: raktapita; ***English***: red creeper; ***Gujarati***: ragatarohado; ***Hindi***: pitti; ***Kannada***: malamaitra, papudi, popli, pupli; ***Konkani***: khandvel, kanvel; ***Marathi***: kanvel, lokhandi, sakalyel; ***Oriya***: roktopitta, sajumalo, toridi; ***Sanskrit***: raktavalli; ***Tamil***: papilli, surali, surulbattaikhodi, vembadam, vempadam; ***Telegu***: ettashirattalativva, ettasurugudu, papri, putika, suratatige, suratichekka, surgugudu.

Description

A large, woody, evergreen climber, with branches hanging down in festoons; bark

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dark grey with vertical cracks exposing the vermillion inner bark surface; young branches grey-pubescent, older dark grey, glabrous. Leaves alternate, oblong-lanceolate or elliptic-ovate to orbicular, 1.7–8.5 cm long and 1.4–3.2 cm wide, pubescent beneath when young, base generally rounded, apex acute or sub-acuminate, margins entire or crenate; lateral nerves 4–8 pairs, ascending and converging near the margin; petioles up to 8 mm long; stipules very small, lanceolate, pubescent. Inflorescences axillary and terminal panicles, minutely grey-pubescent, occasionally with leafy bracts. Flowers numerous, 3–5 mm across, yellowish-green, with an offensive odour; calyx lobes 5, 1.5–2.5 mm long, spreading; petals 5, obcordate, truncate, shorter than the calyx lobes. Fruit a subglobose nut 5–7 mm in diameter, yellow to grey, enclosed in a persistent calyx rim to about the middle and prolonged into a linear pubescent wing 2.2–4 cm long and 0.6–0.8 cm wide; seed globose, 3–4 mm in diameter, thin-walled, brown. In central India, flowering occurs between November and January and fruiting from February to April.

Distribution and habitat

Native to tropical Asia from India and Sri Lanka eastwards to Myanmar (Burma) and Java. Common in semi-evergreen and deciduous forest, chiefly along streambanks in western peninsular India from Maharashtra southwards, though also reported in Orissa, central India, Bihar and West Bengal.

Medicinal properties and uses

The powdered root bark has carminative, stomachic, tonic and stimulant properties; is prescribed in the treatment of atonic dyspepsia, debility and mild fevers. Mixed with gingelly oil (from seeds of *Sesamum orientale*: *Pedaliaceae*), the powdered bark is used in South India as a local application to relieve itches and other skin irritations. The seeds are edible after cooking, and the seed oil is used for cooking. The root bark is a source of a valuable reddish dye (*ventilagin*) used for colouring cotton, wool and silk.

References

Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Nadkarni (1954), Yoganarasimhan (1996).

Ziziphus mauritiana Lam.

Botanical synonyms

Rhamnus jujuba L., *Ziziphus jujuba* (L.) Gaertn.

Common names

Bengali: bogri; ***English***: common jujube, Indian jujube, jujube; ***Gujarati***: ber, bor, bordi; ***Hindi***: baer, ber, beri; ***Kannada***: badari, bore, elanji, gotta, jelachi, yalachi, yelchi; ***Konkani***: ber, bor; ***Malayalam***: badaram, cherumali, elentha, kolam, lanta, perintutali; ***Marathi***: baher, bera, bor; ***Oriya***: barakoli, barkoli, bodokoli, bodouri, borokoli; ***Punjabi***: ber, beri, unab; ***Sanskrit***: badara, badarah, badari, kola, koli, sauvira; ***Tamil***: elandai, elladu, ilandai, ilantha, yellande; ***Telegu***: gangareegu, gangarenu, karakandhavu, reegu, regu, rengha; ***Urdu***: ber.

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Description

A small evergreen shrub or tree, generally 5–10 m tall, with a spreading crown and drooping branches; bark rough, dark grey with vertical cracks, young branches rusty-tomentose; stipular spines solitary or in pairs, both straight or one recurved. Leaves alternate, variable, ovate-oblong or elliptic or suborbicular, 2–9 cm long and 1.5–5 cm wide, rounded at both ends, often mucronate at apex, densely white or brown silky-tomentose beneath, margins serrulate or entire, basally 3-nerved; petioles 0.5–1.2 cm long, tomentose. Inflorescences axillary, sessile cymes or fascicles of 10–12 flowers. Flowers greenish-yellow, 4–6 mm across; pedicels 2–4.5 mm in flower, and to 8 mm long in fruit; calyx lobes ovate, acute, tomentose without, calyx tube campanulate; petals 1–1.5 mm long, spathulate, reflexed. Fruits (drupes) oblong-globose or ovoid, 1–1.5 cm in diameter, usually 2-celled, fleshy, glabrous, yellowish-orange to red when ripe; kernel irregularly furrowed with a hard, stony shell; seeds compressed. Depending on locality, flowering occurs between April and October, and the fruits ripen after about 5 months, normally between October and March. In central Indian deciduous forest zones, trees remain leafless for about 2 months between March–April and May–June.

Distribution and habitat

Probably originally from the Middle East or the Indian subcontinent, but now cultivated throughout the tropics and subtropics for its nutritious, edible fruits; commonly naturalized. In India, it is found throughout the country to an altitude of approximately 1500 m in the Himalayas, typically on or near old village sites, and very commonly on black cotton soils in central India. Low, shrubby varieties are the most common. In its wild state, the tree is found mainly in dry regions, where it is often gregarious, frequently associated with *Acacia catechu* (*Fabaceae-Mimosaceae*). There are a large number of cultivated types that differ in fruit size and quality.

Medicinal properties and uses

All parts of the tree are used in traditional Indian medicine. The mucilaginous fruits of wild trees are considered cooling, anodyne and tonic. They are considered to purify the blood and to aid digestion, and are used in the medicinal preparation known as *Joshanda* to treat chest complaints. In southern Orissa the fruit pulp mixed with curd (yoghurt), pomegranate juice and sesame oil

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is taken orally to treat dysentery. The kernels are reported to have a sedative effect and are recommended as a soporific. They are prescribed to stop nausea and vomiting and for relief of abdominal pain in pregnancy. They are also given as an antidote in cases of aconite-poisoning and are used in poultices and other applications to treat wounds. The dried, powdered fruits are taken with water by Sahariya women in northwestern Madhya Pradesh to promote fertility. The leaves are used to form a plaster to treat strangury, and are eaten with betel-nuts (seeds of *Areca catechu*: *Arecaceae*) as an astringent. Regarded as a diaphoretic, they are prescribed to treat typhoid in children. A paste prepared from the leaves is used as an external application to treat scorpion stings in northeastern Karnataka. A decoction of the bark is used in the treatment of diarrhoea and dysentery. The bark is also used as an astringent to treat gingivitis. The root is used in a decoction to alleviate fever, and as a powder to promote healing of old wounds and ulcers. In Ayurveda, it is used as a substitute for *badara* (*Ziziphus xylopyrus*), the root bark and fruits being used to treat thirst, bronchial asthma and diarrhoea, and as an aphrodisiac, emetic, carminative and digestive.

References

Chopra *et al.* (1956), CSIR (1948–1992), Mohanty *et al.* (1996), Seetharam *et al.* (1999), Sikarwar and Kaushik (1992), Yoganarasimhan (1996).

Ziziphus nummularia Wight & Arn.

Botanical synonyms

Rhamnus nummularia Burm. f., *Ziziphus rotundifolia* Lam.

Common names

English: wild jujube; ***Gujarati***: adbaubordi, chanibor, chanyabor, ganjer, khetraubordi; ***Hindi***: jhadiaber, jhahrberi, jharber; ***Kannada***: paraji, parapele, parpali, parpuli, purpalli; ***Marathi***: chanyabor, gangar, janglar, junglaber, junglebor; ***Punjabi***: bal, ber, birota, jarberi, jharpala, kokanber, maraber; ***Sanskrit***: karkandhu, sukshamaphala; ***Tamil***: korgodi, parpalligidda; ***Telegu***: neelareegu, nelaregu; ***Urdu***: zariab.

Description

A small thorny shrub with spreading branches; branchlets divaricate, slender, flexuous, zigzag; stem and branch bark pale purplish or grey-velvety. Leaves ovate or orbicular, 1.2- 2 cm long and wide, spinous-serrate, densely white or buff tomentose beneath; petioles 3–6 mm long, tomentose; stipular thorns usually in pairs, one straight, sharp and slender, nearly as long as the leaf, the other short, hooked. Flowers pale yellow, borne in axillary, pubescent cymes; calyx pubescent outside, cleft about halfway down, lobes triangular-ovate; petals cuneate, rounded or truncate at apex, longer than the stamens. Fruit a globose drupe, glabrous, 0.8–1 cm in diameter, red or black when ripe, edible.

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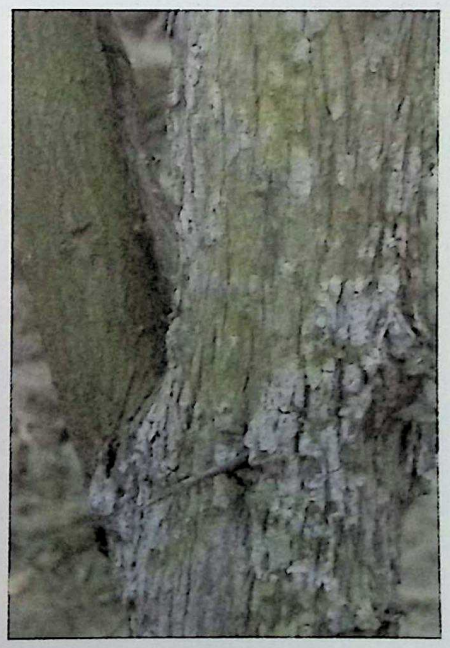
Distribution and habitat

Native to dry and arid regions of subtropical and tropical Asia from Iran to India. Very common in grasslands and semi-arid and arid scrub forests in Punjab, Rajasthan and Gujarat; also found in peninsular India from Maharashtra and Madhya Pradesh southwards, up to an elevation of approximately 900 m. Common on black cotton soils in peninsular India.

Medicinal properties and uses

In Unani practice, the leaves are applied externally to treat scabies, boils and other cutaneous diseases; their decoction is used as a hip-bath to relieve joint pains, and as a gargle for sore throat and bleeding gums. Among the tribal and other rural inhabitants of Bhavnagar District in Gujarat, a decoction of the leaves is given to relieve stomatitis and toothache. The dried leaves are burnt and the smoke inhaled to relieve coughs and colds. The fruits are cooling and astringent, and used to treat bilious affections. In Ayurveda, it is used as a substitute for *badara* (*Ziziphus xylopyrus*), the root bark and fruits being used to treat thirst, bronchial asthma and diarrhoea, and as an aphrodisiac, emetic, carminative and digestive. Among the tribal inhabitants of Udaipur District in Rajasthan, a paste of the bark is used to promote the healing of cuts and wounds, and the powdered bark is added to bath water to relieve sunburn.



References

Bhatt and Mitaliya (1999), Chopra *et al.* (1956), CSIR (1948–1992), Katewa and Arora (1997), Kirtikar *et al.* (1935), Nadkarni (1954), Yoganarasimhan (1996).

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Ziziphus oenoplia (L.) Mill.

Botanical synonym

Rhamnus oenoplia L.

Common names

Bengali: mahkoa, shyakul, siakul; ***English***: jackal jujube; ***Hindi***: makoh, makai, makor, makoya, mokha; ***Kannada***: barige, challe, hurasurah, karisurimullu, purgi, suri mullu; ***Malayalam***: kottavalli, mulli, tutalimullu; ***Marathi***: iruni, kanerballi, makor; ***Oriya***: barokoli, kontakoli; ***Sanskrit***: srigalakoli; ***Tamil***: ambulam, kottei, suraimullu, suraiyilandai; ***Telegu***: banka, paragi, paraki, paranu, pariki, paringi.

Description

A straggling, sometimes climbing, deciduous shrub up to 5 m tall, with strigose, rusty-pubescent branches; spines usually paired, 3.5–6 mm long: one straight, the other recurved. Leaves obliquely ovate-lanceolate, 2.4–6.5 cm long and 1.5–3.2 cm wide, glabrous or pubescent above, golden-brownish hairy below, base obliquely subacute, apex acute-acuminate, margins minutely denticulate, basally 3–4-nerved; petioles 3–6 mm long, brown-tomentose. Inflorescences axillary, short-peduncled cymes, 20–25-flowered; calyx lobes triangular or ovate, 1.5–2 mm long; petals obovate, *c.* 1 mm long, emarginate, green. Fruits (drupes) globose or ovoid, 3–5 cm in diameter, 1–2-celled, black and shining when ripe, with acrid pulp; seeds 1–2, ovoid. Flowers from April to September, depending on locality; fruits ripen during the winter, mainly between November and December in central India.

Distribution and habitat

Widely distributed from the Middle East through the Indian subcontinent to Malaysia and Australia. Common throughout the drier regions of India, it is a characteristic species of heavily grazed, dry deciduous forests.

Medicinal properties and uses

In Ayurveda, the edible fruit is used as a substitute for *badara* (*Ziziphus xylopyrus*), the root bark and fruits being used to treat thirst, bronchial asthma and diarrhoea, and as an aphrodisiac, emetic, carminative and digestive. In Siddha, the fruit and seeds are used to treat fever, urine retention, some forms of poisoning, coryza, and as an aphrodisiac and tonic. The fruit is used as a constituent in a medicine used by the Mundas to treat stomach-ache. Aboriginal tribes (Bhumijis, Kherias, Birhorns and the Santhalis of Purulia District in West Bengal) use the roots to treat hyperacidity and *Ascaris* infection. A decoction of the bark is said to promote the healing of fresh wounds.

References

Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Nadkarni (1954), Yoganarasimhan (1996).

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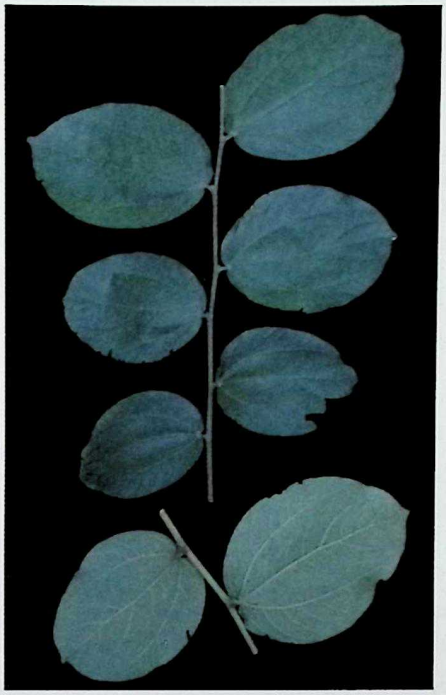
Ziziphus rugosa Lam.



Common names

Bengali: shiakul; ***Hindi***: churna, dhaura, pitondi, sagra, suran; ***Kannada***: belahadukina, bilisurimullu, kottamullu, mahigotte; ***Malayalam***: malantutali, todali, tutali; ***Marathi***: churna, suran, turan; ***Oriya***: chunakoli, kanokoli, katokoli, simukoli, sunokoli; ***Tamil***: charai, kattilandai, surai, todari; ***Telegu***: banka, pinduparighamu.

Description

A scrambling, spiny, evergreen shrub or small tree 3–6 m tall, sometimes forming dense thickets; branchlets densely clothed with a rust-coloured tomentum; spines usually solitary, recurved, tomentose except at the tip. Leaves broadly elliptic or orbicular, 5–13 cm long and 4–6 cm wide, apex rotund, mucronate, base oblique, glabrous above, tomentose beneath, margin serrate, basally 3-nerved; petioles usually 0.5–1 cm long, tomentose. Inflorescences composed of pedunculate cymes forming terminal panicles up to 30 cm long, tomentose; peduncles up to 6 cm long. Flowers yellowish-green, 4–5 mm across; pedicels 4–6 mm long, densely tomentose; calyx lobes 5, ovate, *c.* 2 mm long, acute, pubescent without; petals absent. The edible fruits (drupes) are globose or pyriform, 6–12 mm long and 9–10 mm in diameter, fleshy, white when ripe; seeds 1–2, obovoid, compressed, black. In central Indian deciduous forests flowering occurs mainly between February and April, and fruiting from May to July.

Distribution and habitat

Native to Pakistan, India, Nepal, Bangladesh, Myanmar (Burma) and Sri Lanka. In peninsular India it is generally confined to dry deciduous forest areas in the hills, to an elevation of about 1600 m in the Western Ghats.

Medicinal properties and uses

The bark is used as an astringent to stop diarrhoea. Powdered and mixed with *ghee* (clarified butter), it is applied to check swellings caused by tooth infection and as a remedy for spongy gum and ulcers in the mouth. The flowers are used in a 2 : 2 : 1 mixture with the petioles of betel (*Piper betle*: *Piperaceae*) and lime and taken in 4-grain pills twice daily to treat menorrhagia.

References

Chopra *et al.* (1956), CSIR (1948–1992), Mukherjee and Namhata (1990), Kirtikar *et al.* (1935), Nadkarni (1954).

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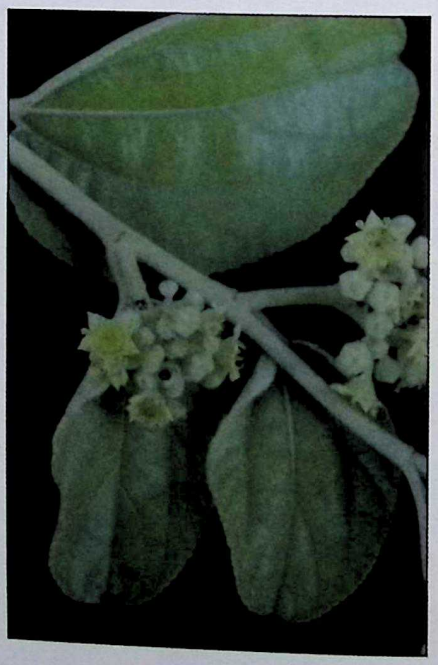
Ziziphus xylopyrus (Retz.) Willd.



Botanical synonym

Rhamnus xylopyrus Retz.

Common names

Hindi: bhander, chitena, ghatbor, ghont, gote, kakor, kat-ber; ***Kannada***: challe, gotta, mullukare; ***Marathi***: bhorgotti, goti, kantegoti; ***Oriya***: got, gotoboro, kantabohul; ***Sanskrit***: ghonta; ***Tamil***: kottai; ***Telegu***: gotte, gotti.

Description

A large, straggling deciduous shrub or small tree; young branches, inflorescence and fruits covered with short, matted, greyish pubescence (or tomentum); spines in pairs, one straight and the other curved. Leaves broadly elliptic or ovate-oblong, to 8 cm long and 4 cm wide, glabrous, dark above and covered with soft and pale tomentum beneath, base obliquely subcordate, apex acute, margins serrate, each tooth with a deciduous gland, basally 3–4-nerved, primary nerves prominent; petioles *c.* 1.2 cm long. Flowers borne in compact axillary clusters; calyx lobes 5, triangular, 2–2.5 mm long; petals 5, 1.5–2 mm long, spathulate, yellowish-green. Fruits globose, 1.6–2.5 cm in diameter, usually 3-celled with a seed in each cell, very hard and woody; seeds oblong, compressed, black. Flowers between April and June, fruits ripen from January to April.

Distribution and habitat

Native to India, Nepal and Sri Lanka. Found throughout India in dry, deciduous or scrub forests and grasslands, often forming dense thickets when young. The tree is one of the chief hosts for *lac* insects, and is cultivated for this purpose in Punjab, Uttar Pradesh, Maharashtra and Madhya Pradesh.

Medicinal properties and uses

Among the Gonds of Uttar Pradesh the powdered leaf along with the powdered root of *Cassine glauca* (*Celestraceae*) is given after menstruation as an oral contraceptive. An oil prepared by soaking the stem bark in boiling mustard oil is prescribed as a body massage for infants suf-

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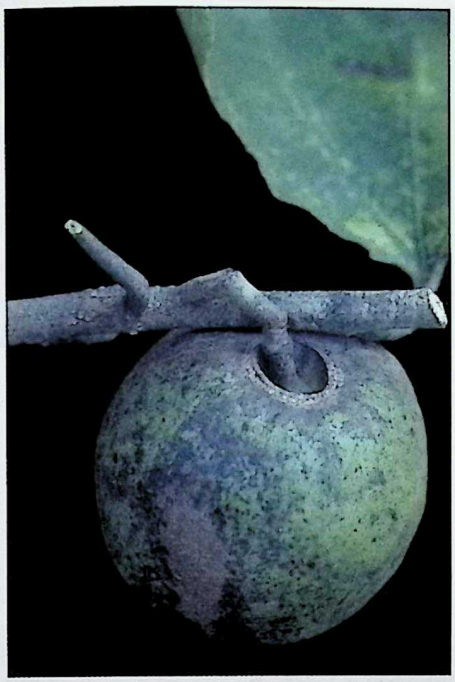

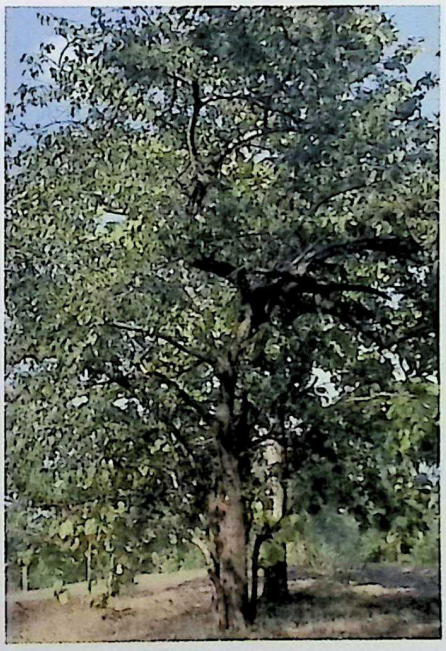

fering from fever and cold among the tribal inhabitants of southern Bihar. In Ayurveda the root bark and fruit are used to treat bronchial asthma and diarrhoea, and as an aphrodisiac, emetic, carminative and digestive.

References

CSIR (1948–1992), Girach and Aminuddin (1995), Nadkarni (1954), Singh and Prakash (1994), Yoganarasimhan (1996).

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Rosaceae

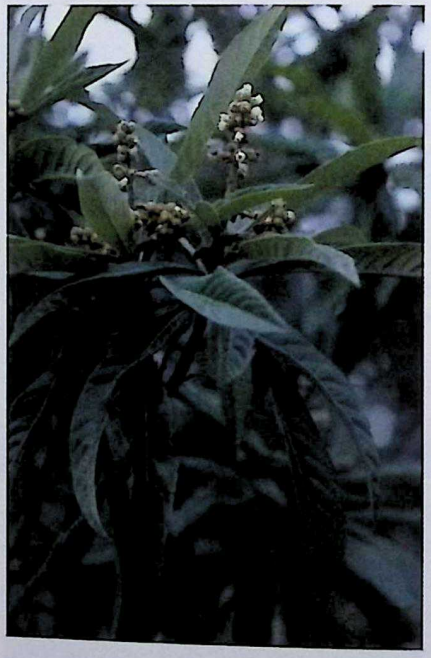
Eriobotrya japonica (Thunb.) Lindl.

Botanical synonyms

Crataegus bibas Lour., *Mespilus japonica* Thunb.

Common names

English: Chinese medlar, Japanese medlar, loquat; ***Hindi***: logat, lokat; ***Kannada***: lakkote, lakkotehannu; ***Sanskrit***: lottaka; ***Tamil***: ilakotta, laktta, nokkotta; ***Urdu***: lakhota.



Description

A small evergreen tree to 8 m tall with spreading branches; branches and inflorescence rusty-tomentose. Leaves thick, coriaceous, 15–20 cm long and 3.8–7.5 cm wide, narrowly oblanceolate, apex acuminate, margins remotely serrate, nerves 12–15 pairs, prominent beneath, base narrowed into a very short, stout woolly petiole; stipules 1.3 cm long. Flowers 1.3 cm across, white or creamy, fragrant, borne in terminal panicles 7.5–15 cm long. Fruits (berries) 2.5–3.8 cm in diameter, oval, rounded or pyriform, formed from the calyx tube, succulent, pale yellow to deep orange when ripe, borne in loose clusters; seeds 1–10 (usually 3–5), large, angular, embedded in a sweetish, acidic, edible pulp. Numerous varieties that differ in their fruit characteristics have been developed in India, China, Japan, the USA and in other countries.

Distribution and habitat

Probably native to southeastern China and Japan; cultivated for its fruits and as an ornamental throughout the tropics and subtropics. In India it is found under cultivation to an elevation of 1500 m, particularly in southern Karnataka and western Tamilnadu; occasionally naturalized. It

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grows well under mild, humid conditions in tropical highland regions between 700 and 2000 m elevation.

Medicinal properties and uses

The fruit is considered to be sedative and is used for allaying vomiting and thirst in Unani medicine. An infusion of the leaves is given to treat diarrhoea, and the tincture is used to relieve indigestion. The flowers are used as an expectorant in Chinese medicine.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935), Nadkarni (1954), Yoganarasimhan (1996).

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Rubiaceae

Borreria articularis (L. f.) F.N. Williams

Botanical synonyms

Borreria hispida (L.) K. Schum., *Spermacoce articularis* L. f., *S. hispida* L.

Common names

Bengali: madana-banta-kadu; ***English***: shaggy buttonweed; ***Gujarati***: madhuri jadi; ***Hindi***: guthri, madanaghanti; ***Kannada***: madanabudumaegiddah; ***Marathi***: ghanti-chi-bhaji, gondi; ***Oriya***: solaganthi; ***Sanskrit***: madanaghanti; ***Tamil***: nattaichuri, nuttichoori; ***Telegu***: madana, madanabudata, madanagrandthi, modinana.

Description

A procumbent herb with a stout taproot; stems quadrangular, hirsute, hispid or subglabrous, usually with long internodes. Leaves subsessile, 1.3–5 cm long and 0.8–2 cm wide, oblong or elliptic, apex acute, scabrid, pubescent or nearly glabrous with scabrid or ciliate margins; stipules membranous. Flowers blue, pale mauve or white, 4–6 together in a whorl within a stipular cup; bracts lanceolate-subulate, hyaline; calyx hispid, 4 mm long, tube narrowly campanulate, teeth linear-lanceolate, acutely pointed, as long as the tube; corolla 4–5 mm long, lobes 2 mm long, oblong, acute. Fruits (capsules) 5 mm long, hard, usually hairy, ellipsoid, rounded at both ends; seeds 3–4 mm long, oblong or ovoid, ventrally grooved, granulate, brown.

Distribution and habitat

Native to tropical Asia from northern India southwards and eastwards to southern China, the Philippines, Malaysia and Sri Lanka. Found throughout the drier parts of India as a weed in cultivated and fallow lands and pastures. In southern India it is

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common on coastal sands and inland on dry sites up to 900 m elevation.

Medicinal properties and uses

A decoction of the herb is used to relieve headache and that of the roots is used as a mouthwash to relieve toothache and as an alterative. In Orissa the leaf juice is used to treat conjunctivitis. An extract of the leaves is given as an astringent for haemorrhoids and gallstones. The seeds have demulcent properties and are used to treat diarrhoea and dysentery. They are stimulant and sometimes used as a substitute for coffee. In Siddha, the roots and seeds are used in the treatment of dysentery, fever and coryza.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

Canthium parviflorum Lam.

Botanical synonym

Plectronia parviflora (Lam.) Bedd.

Common names

English: wild jessamine; ***Kannada***: balasu, ganduk-koral, kari, mullumusta, ollepode; ***Konkani***: kayili; ***Malayalam***: kantakara, niruri, serukara; ***Marathi***: kadbar, kirma; ***Oriya***: tutidi; ***Sanskrit***: chayatinisah, gangeruki, kari, nagabala; ***Tamil***: kadalattal, karai, kudiram, nallakkarai, sengarai; ***Telegu***: balasu, sinnabalusu.

Description

A rigid, thorny, deciduous shrub or small tree, with stiff and spreading branches armed with stout, straight, nearly horizontal, paired spines 2–5 cm long above leaf axils. Bark brown to grey with vertical fissures. Leaves opposite, 2–4 cm long and 1.3–2.5 cm wide, often fascicled on young shoots, ovate, obovate or suborbicular, glabrous, apex obtuse, base cuneate, green above, whitish beneath; main nerves 4–6 pairs; petioles 2.5–6 mm long, slender; stipules shortly triangular at base, long-pointed at apex. Flowers small, white or pale greenish-yellow, in slender, few-flowered cymes; calyx 1.2–1.5 mm long, lobes 4, triangular, acute; corolla 4 mm long, tube inflated, lobes as long as the tube, ovate, acute. Fruit (drupe) oblong-ellipsoid, compressed, about 1 cm long and 0.5 cm wide, yellow when

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ripe, edible, 2-seeded. In central India, flowering occurs mainly between May and July and fruiting in November–December.

Distribution and habitat

Occurs naturally to an elevation of 1000 m in western peninsular India from Gujarat and Maharashtra southwards, in Bihar and Orissa, and in Myanmar (Burma) and Sri Lanka.

Medicinal properties and uses

The edible leaves and fruit constitute the Ayurvedic drug *Kari*, which is astringent and effective against cough and indigestion. The root is considered anthelmintic. A decoction of the root and of the leaves is prescribed to treat certain stages of flux. The bark of the young branches is used to treat dysentery in Indochina. The plant is sometimes used as an antispasmodic.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

Catunaregam spinosa (Thunb.) Tiruv.

Botanical synonyms

Gardenia floribunda Roxb., *G. spinosa* Thunb., *Randia brandisii* Gamble, *R. dumetorum* (Retz.) Poir., *R. longispina* Wight & Arn., *R. tomentosa* Wight & Arn., *Xeromphis spinosa* (Thunb.) Keay

Common names

Bengali: madan, mainphal, menphal, panji; ***English***: common emetic nut; ***Gujarati***: ghede, laso, medhola, mindhal, mindhala, mindhatigoe; ***Hindi***: arar, karhar, madan, maindal, mainhar, maini, mainphal; ***Kannada***: aremadalu, banegara, kamangri, kare, karigidda, maggare, mangari; ***Konkani***: gaddi; ***Malayalam***: kare, karalikkaya, kattakre, kattunaranna; ***Marathi***: gelaphala, ghela, hinganbet, mendhal, mindhal, monigeli, peralu, pindra; ***Oriya***: mohana, pativa, potowa, salara, sarla; ***Punjabi***: arara, mandkolla, mindhal, mindla; ***Sanskrit***: madana, madanah, pinditaka; ***Tamil***: kadudam, kalagam, kattukoyya, madukkarai, marukkallankay, marukkarai, mathukarai; ***Telegu***: madanamu, manda, manga, mangara, sinnamanga; ***Urdu***: mainphal.

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Description

A deciduous thorny shrub or small bushy tree up to 9 m tall, with rough, scaly, dark brown or grey bark, horizontal branches, and stout, straight, paired, nearly opposite, axillary spines 1.3–3.2 cm long. Leaves mostly clustered on short branchlets, obovate, wrinkled, 2.5–7.5 cm long and 2–3.2 cm wide, apex obtuse, base narrowed into a short petiole, shining above, more or less pubescent above and on the nerves beneath; main nerves 6–10 pairs; stipules ovate, acuminate. Flowers fragrant, borne singly or in pairs at the ends of short, leaf-bearing branchlets; calyx 1.3 cm long, densely hairy, tube broadly campanulate, teeth 5, foliaceous, 5 mm long, ovate-oblong; corolla 2 cm long, at first white, turning yellow, tube 5–6 mm long, densely hairy outside, lobes 1.3 cm long and nearly as broad, obovate-oblong, rounded at apex, pubescent outside, spreading. Fruit (berry) yellow when ripe, subglobose or broadly ovoid, smooth or obscurely longitudinally ribbed, 3–3.7 cm long; seeds many, flat, angular, about 0.4 cm long. The species is polymorphic, and some authors have split it into three: *Randia dumetorum*, distributed in the eastern coastal districts of Andhra Pradesh, Tamilnadu and parts of the Deccan; *R. longispina*, distributed in northern India from Kumaon to Assam southward to the hills of Vishakhapatnam in northeastern Andhra Pradesh; and *R. brandesii*, distributed in peninsular India, mainly in the western regions. In central India, flowering occurs in May–June and fruits ripen between November and January.

Distribution and habitat

Native to tropical Asia from India to Sri Lanka, Indonesia and southern China; also found in tropical East Africa. Occurs in moist and dry deciduous forests throughout India to an elevation of 1350 m in the Himalayas and to 1200 m in the Western Ghats.

Medicinal properties and uses

The pulp of the fruit, dried and powdered, is thought to be a valuable emetic and is used as a substitute for ipecac (from *Cephaelis ipecacuanha*: *Rubiaceae*). In small doses it produces nausea and is used as an expectorant and diaphoretic. It is considered to have anthelmintic and abortifacient properties, and to be useful as a nervine sedative and antispasmodic. Among the tribal inhabitants of Prakasam District in southern Andhra Pradesh, the juice from the fruits is used as an ear- and nosedrop to treat hysteria and an eyedrop to remove cataracts; a paste of the fruit is rubbed on the head to cure dandruff and prevent hair loss. Ground to a powder and applied to the tongue and palate, it is used as a home remedy for fevers and other ailments common in children during teething.

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The fresh ground fruits are applied externally to relieve swellings among the tribal inhabitants of western Maharashtra; in eastern Bihar, they are applied to the forehead to relieve the discomfort of high fever in children. The seeds are reportedly used as a tonic and to induce appetite. The bark is astringent and used to treat diarrhoea and dysentery, and an infusion of the bark is used as an emetic. It is given internally and applied externally in the form of a paste as an anodyne for rheumatism, and to relieve bruises and aching bones during fevers. Its decoction is taken internally and applied externally to relieve headaches and fever by the tribal inhabitants of Sandargarh district in Orissa; it is also considered a sedative and nervine calmative. Among the Gonds of Uttar Pradesh, the root bark is chewed in cases of scorpion sting; its extract is given in the treatment of typhoid fever.

References

Chopra *et al.* (1956), CSIR (1948–1992), Jha and Varma, 1996, Kirtikar *et al.* (1935), Mukherjee and Namhata (1990), Singh and Prakash (1994), Upadhye *et al.* (1994), Vijaya Kumar and Pullaiah (1998), Yoganarasimhan (1996).

Catunaregam uliginosa (Retz.) Sivarajan

Botanical synonyms

Gardenia uliginosa Retz., *Randia uliginosa* (Retz.) Poir., *Tamilnadia uliginosa* (Retz.) Thiruv. & Sastre, *Xeromophis uliginosa* (Retz.) Mahesh.

Common names

Bengali: piralo; ***English***: grey emetic nut; ***Gujarati***: gandega, gangad, gangeda, gengdi, gogda; ***Hindi***: bhirara, katul, panar, perar, pindalu; ***Kannada***: banbugri, doddakare, garudakare, kare, ollekare, pannadri, pendri; ***Konkani***: pindara; ***Malayalam***: kara, karei, karu, pannikara, punankare; ***Marathi***: cindra, panelra, pendari, phetra, telphetru, tupkela; ***Oriya***: pendoroha, pendra, potua, thelko, tolkor; ***Sanskrit***: pinditaka; ***Tamil***: kalikarai, perunkarai, vagatta, valikkarai, vargarai; ***Telegu***: adivimanga, goanka, nallaika, nalla kaksha, peddamranga; ***Urdu***: pindalu.

Description

A deciduous tree up to 7.5 m tall with scaly, reddish-brown bark, numerous, thick horizontal branches, and quadrangular branchlets terminating in 1–2 pairs of sharp spines 1.3 cm long. Leaves fascicled at the ends of short branchlets, usually 6.3–13 cm long and 3.5–5 cm wide, obovate or obovate-oblong, apex obtuse, glabrous and shining above, more or less pubescent and reticulately veined beneath, tapering to the base; main nerves 6–8 pairs; petioles very short; stipules acute from a broad base. Flowers solitary at the ends of short branchlets, white, fragrant, 3.8–5 cm in diameter; calyx 1.3 cm long, fleshy, green, limb broadly tubular with 5–7 rounded shallow lobes *c.* 3 mm long; corolla glabrous outside, tube very short with a ring of white hairs at the mouth;

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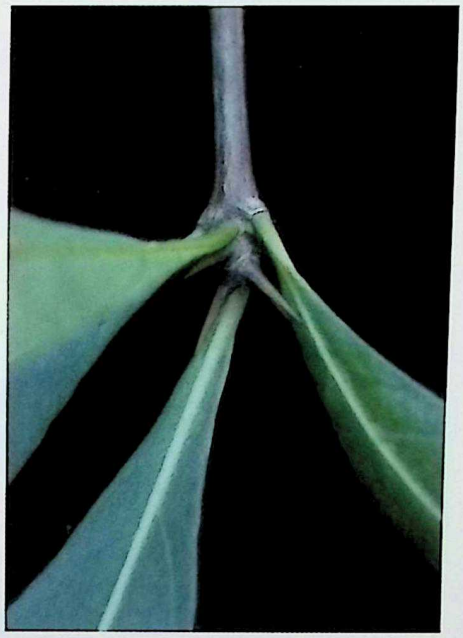
lobes 5–7, orbicular, overlapping. Fruit (berry) ellipsoid or ovoid, 5–6.3 cm long, smooth, yellowish-brown when ripe, crowned with a persistent calyx, containing about 12 compressed, smooth seeds closely packed in pulp. In central India, flowering occurs in May and June; fruits ripen between December and April.



Distribution and habitat

Native to India and Sri Lanka, occurring naturally in the sub-Himalayan hill forests from the Yamuna eastwards but more commonly in eastern, central and southern India. It is typically found in open forest habitats and grasslands and on low-lying waterlogged soils.

Medicinal properties and uses

The unripe fruits are astringent; they are used in the form of a paste as an external application to treat bleeding piles among the Paudi Bhuinya in northern Orissa. The roasted pulp is used as a remedy for diarrhoea and dysentery, especially during pregnancy. The roots are considered to possess cooling, diuretic and tonic properties in Ayurveda and Unani. They are used to treat biliousness and boils in children; boiled in *ghee*, they are given for diarrhoea and dysentery. Among the Rabaris in the Barda Hills of Gujarat, the boiled extract of the root bark is used to wash wounds and sores. The ripe fruits are eaten boiled or roasted, either alone or in curries, and the unripe fruit pulp is used in dyeing as a colour intensifier.

References

Aminuddin and Girach (1996), Chopra *et al.* (1956), CSIR (1948–1992), Jadeja (1999), Kirtikar *et al.* (1935).

Coffea arabica L.

Common names

Bengali: kafi, kapi; ***English***: coffee; ***Gujarati***: caffi, bund; ***Hindi***: bun, kafi; ***Kannada***: caffi; ***Konkani***: bunna; ***Malayalam***: bannu; ***Marathi***: bund, caffi; ***Sanskrit***: kaphi, mlechca-phala, rajapiluh; ***Tamil***: kapikottai; ***Telegu***: kapi vittulu.

Description

A glabrous shrub or small tree. Leaves 12–18 cm long, opposite, oblong, acuminate, narrowed into short petiole; main lateral nerves 6–10 pairs, joined by intramarginal veins and slender parallel reticulate veins. Flowers fragrant, numer-

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ous, borne in axillary fascicles; corolla funnel-shaped, lobes oblong and as long as the tube. Fruit (berry) small, fleshy, dark purple when ripe.

Distribution and habitat

Native to Ethiopia and Sudan and cultivated in many tropical countries. In India it is cultivated mainly in the south, and is occasionally naturalized in the Western Ghats.

Medicinal properties and uses

An infusion of the dried ripe seeds is used as a stimulant, nervine tonic and diuretic. In Ayurveda, the leaf and seed are used in the treatment of anorexia, dysentery, cardiac diseases, urinary calculi, fevers, thirst, stomach disorders, vomiting and headache. In Siddha, the seeds are used as a stimulant, diuretic, antilithic and antisoporific.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

Gardenia latifolia Ait.

Botanical synonym

Gardenia enneandra Koen.

Common names

English: boxwood gardenia; ***Hindi***: ban pindalu, paphar, papra; ***Kannada***: adavi, bikke, kalkambi; ***Malayalam***: pempri; ***Marathi***: ghogar, ghogari, gogarni, pandru, papur; ***Oriya***: damkurdu, jantia, kota ranga; ***Sanskrit***: pap parpataki; ***Tamil***: kumbay, kumbi, perungambil; ***Telegu***: gaiger, pedda bikki, peddakaringuva, yerrabikki.

Description

A small deciduous ornamental tree to 4 m tall with a low, bushy crown; occasionally an epiphyte. Bark smooth, grey, peeling off in flakes. Leaves opposite, broadly ovate, usually clustered at the ends of branches, 10–20 cm long, shining, secondary nerves prominent. Flowers fragrant, solitary, star-shaped, 7.5–10 cm across, pale yellow fading to orange. Fruit globose, 2.5–5 cm in diameter, greenish-yellow when ripe,

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pubescent, edible. In central India flowering occurs in April and May; fruits ripen between February and April of the following year.

Distribution and habitat

Found in dry deciduous forests throughout most of India.

Medicinal properties and uses

The bark is reported to have antispasmodic and febrifuge properties and is sold in central and north Indian markets as the Ayurvedic drug *Bharangi* (accepted source: *Clerodendrum serratum*: *Verbenaceae*). The leaves are reportedly used to treat snake bite.

References

Asolkar *et al.* (1992), CSIR (1948–1992), Yoganarasimhan (1996).

Gardenia resinifera Roth

Botanical synonym

Gardenia lucida Roxb.

Common names

English: white emetic nut; ***Gujarati***: dekamari, dikamali; ***Hindi***: dekamari, dikamali, dikemali; ***Kannada***: bikke, dikkamalli, kallarige, kumbe; ***Konkani***: dikamali; ***Marathi***: dekamari, dikamali; ***Sanskrit***: jantuka; ***Tamil***: kambil, kumbai, tikkamalli; ***Telegu***: erubikki, karinguva, sinnakaringuva, tellakaringuva, tellamanga, yerrabikki.

Description

A large evergreen shrub or small tree 6–7.5 m tall, with smooth grey or dark brown bark; young shoots greyish-green, smooth, resinous. Leaves opposite, elliptic-oblong, 6.3–20 cm long and 2.5–7.5 cm wide, glabrous, apex acute or shortly acuminate, base narrowed into a short (*c.* 3 mm long), marginate petiole; main nerves 20–25 pairs, prominent beneath; stipules large, broadly ovate, acute, membranous. Flowers fragrant, axillary, solitary, from the axils of the uppermost leaves near branch tips; pedicels 0.6–1.3 cm long; calyx 2 cm long, teeth 1 cm long, erect, lanceolate; corolla large, at first white but soon turning yellow; tube 3.2–5 cm long, slender, lobes 5, obovate, obtuse, 3.2 cm long and 2 cm wide, spreading, veined, glabrous. Fruit ellipsoid or globose, 2.5–3.3 cm long,

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smooth, marked with longitudinal lines, crowned by the persistent calyx limb; pericarp thick, woody; placentae 2. The flowers open in the evening. In central India flowering occurs from April to June and fruiting from April to June of the following year.

Distribution and habitat

Occurs naturally in deciduous forests of the western parts of the Indian peninsula and dry districts of Tamilnadu, as well as in southern Bangladesh and Myanmar (Burma); frequently cultivated in gardens.

Medicinal properties and uses

The leaf buds and young shoots exude a transparent, greenish-yellow, unpleasant-smelling gum identical to that collected from *Gardenia gummifera*. Known commercially as *Dikamali* or *Cumbi gum*, it is used as an antispasmodic, expectorant, carminative, diaphoretic and anthelmintic. It is given to children to treat nervous disorders and diarrhoea due to teething, and is applied to the gums to relieve irritation. In Ayurveda it is used to relieve constipation and pains associated with bronchitis and vomiting. Among the Rabaris in the Barda Hills of Gujarat, it is crushed in water and given to treat worms, vomiting and hysteria. Externally it acts as an antiseptic and stimulant, and is often used to clean infected ulcers and in the treatment of skin diseases.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956), CSIR (1948–1992), Jadeja (1999), Vijaya Kumar and Pullaiah (1998).

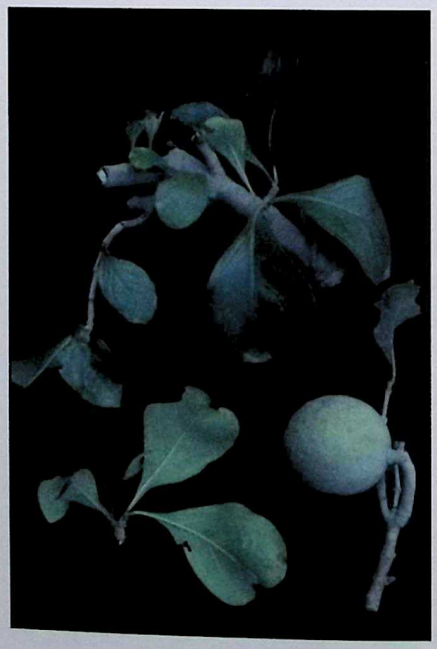
Gardenia turgida Roxb.

Botanical synonyms

Ceriscoides turgida (Roxb.) Tirvengadum, *Gardenia montana* Roxb.

Common names

Gujarati: gungal; ***Hindi***: ghurgia, karamba, karhar, khuriari, thanella; ***Kannada***: bengeri, bongeri, bootbangari, magge; ***Malayalam***: kharkar, malankara; ***Marathi***: khurphendra, pendra, phendra, phetra; ***Oriya***: bamenia, bomonia, darobokrisho, gurana; ***Sanskrit***: bharangi, bharngi, mahapindi; ***Tamil***: malangarai, manjunda, nanjundam; ***Telegu***: kokkita, kuka-elka, manjunda, tella-elka, tellakokkita, yerrabikki, yerribikki.



Description

A small deciduous tree with stout, rigid branches armed with strong, straight, often leaf-bearing axillary spines. Bark smooth, yellowish-grey. Leaves opposite, variable, 2.5–10 cm long, elliptic-obovate or orbicular, apex obtuse or acute, coriaceous, shining above, glabrous-pubescent or tomentose beneath, narrowed into a short petiole, clustered at the ends of branches; pale when dry. Flowers white, fragrant, dimorphic: the male 0.4 cm long, grouped in fascicles, the female 0.8–2 cm long, solitary. Fruit ovoid or globose, 2.5–7.5 cm in diameter, smooth,

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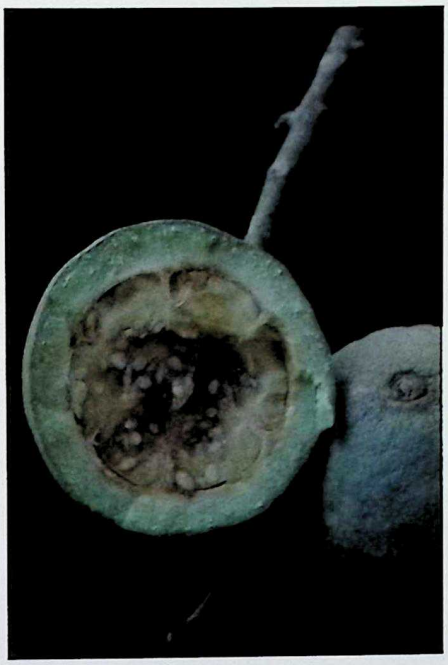
not beaked; pericarp thick, endocarp woody, shining inside; placentae 5–6; seeds numerous, angular. In central India flowers between April and June; fruits mature from April to June of the following year.



Distribution and habitat

Found in open habitats in dry deciduous forests of the lower foothills of the Himalayas from Garhwal to Bhutan, and throughout peninsular India from Bihar and Madhya Pradesh southwards to Tamilnadu. Typically grows on dry stony, lateritic or stiff clay soils, and on rocky hill ridges.

Medicinal properties and uses

A preparation of the roots is used by the Santhalis as a remedy for indigestion in children; the freshly prepared root extract is used to relieve abdominal pains. The crushed roots form a lather with water which is applied on top of the head to relieve severe headaches by the Mundas in the Chota Nagpur region in Bihar and Madhya Pradesh. Among the Gonds of Uttar Pradesh, the root extract, mixed with black pepper, is given for the treatment of spermatorrhoea; the fruit extract is taken orally for 3 days after menstruation as a contraceptive. The fruits are reportedly used to treat affections of the mammary glands. The pounded fruit pulp is also applied to the forehead to relieve fever.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Kumar and Goel (1998), Singh and Prakash (1994).

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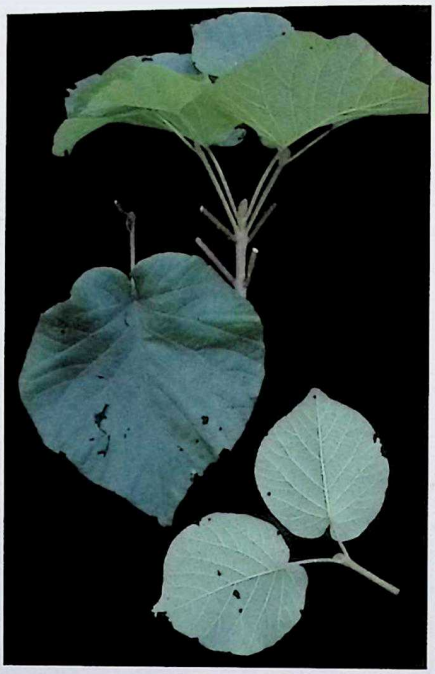
Haldina cordifolia (Roxb.) Ridsdale

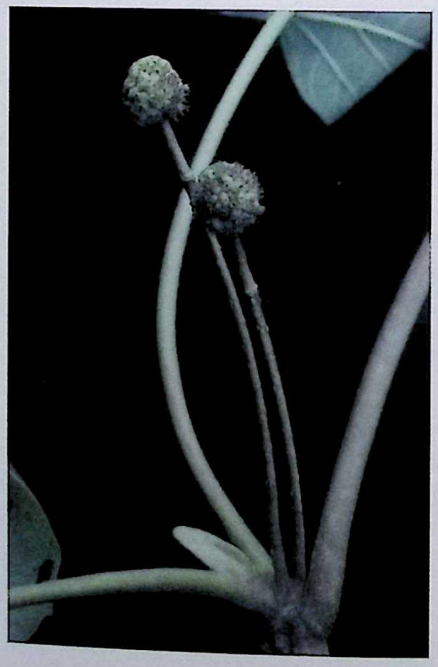


Botanical synonyms

Adina cordifolia (Roxb.) Hook. f. ex Brandis, *Nauclea cordifolia* Roxb.

Common names

Bengali: bangka, dakom, keli kadam, petpuria; ***English***: haldu; ***Gujarati***: aldavan, haladaravo, haladhwan, haldarvo; ***Hindi***: haladu, haldu, hardu, kadami, ladiva; ***Kannada***: ahnau, anigallu, arasintege, hethega, yettega; ***Konkani***: edu; ***Malayalam***: barakuram, katampa, manjakadamba, manjakadambu, yeludijamaram; ***Marathi***: haldarava, haldu, heddi, heddu, honangi, kalamh; ***Oriya***: holonda, holondo, kelikodombo, kurrum, mundi; ***Punjabi***: haldu; ***Sanskrit***: dharakadamba, dharakadambah, haridru, kadambaka; ***Tamil***: bandaru, kadambai, manjakadamba, manjakadambu, rudraganapu; ***Telegu***: bandaru, pachaganapa, pasupu kadamba, rudraganapa.



Description

A semi-deciduous or deciduous tree up to 30 m tall with a large crown and straight stem often irregularly fluted at the base. Bark dark or light grey to reddish-brown, rough, exfoliating in irregular woody scales; inner bark pinkish-brown with white streaks, turning orange-brown on exposure, the juice turning black on the blade of a knife. Terminal vegetative buds flattened, concealed by large, oblong stipules. Leaves opposite, 10–30 cm long and wide, broadly ovate, cordate at base, abruptly acuminate at apex, coriaceous, glabrescent above, pubescent beneath; lateral nerves 5–8 pairs; petioles 3.8–10 cm long, stout, pubescent; stipules 1.3–1.8 cm long, oblong or obovate. Flowers brownish-yellow, borne in globose, axillary, rounded heads 1.8–2.5 cm in diameter; peduncles 1–4 together, 2.5–10 cm long, each bearing a single head; corolla 6 mm long, pubescent. Fruit a head-like infructescence composed of small capsules splitting into 2 dehiscent cocci; seeds numerous, minute, ovate, slightly compressed, narrowly winged. In central India, flowering occurs mainly from June to August; fruits mature between February and May.

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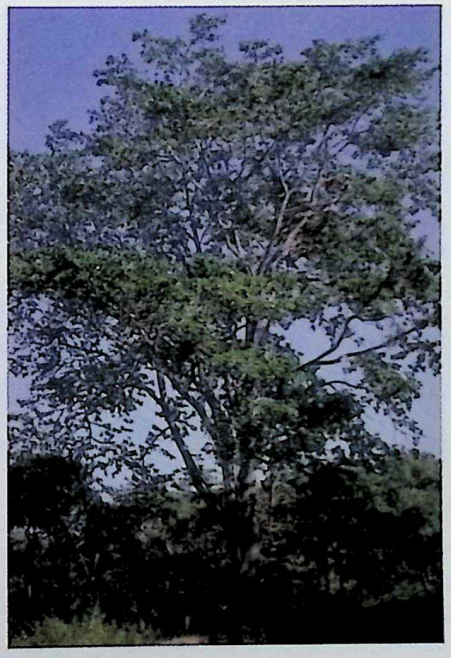
Distribution and habitat

Native to tropical Asia from India and Sri Lanka through Myanmar (Burma), southern China, Indochina, Thailand and peninsular Malaysia. In India it is found scattered in deciduous forests to an altitude of 900 m from the sub-Himalayan tract southwards, typically on deep soils in hilly localities; occasionally gregarious on abandoned agricultural sites in southern India. It is especially common in the Eastern Ghats, Karnataka and locally in the Konkan (coastal Maharashtra).

Medicinal properties and uses

The stem bark is acrid and bitter, is used to relieve biliousness, and is considered to have febrifuge and antiseptic properties; its extract is used by the Gonds of Uttar Pradesh for treating malarial fever and stomach disorders. In Ayurveda, the bark is used to treat worm infestation, vomiting, fever, blood and liver disorders, leprosy and other skin diseases. The roots are used as an astringent to treat dysentery in Cambodia (Kampuchea). The wood is highly valued for construction, and considered to be one of the best Indian timbers for flooring and panelling.



References

Asolkar *et al.* (1992), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Singh and Prakash (1994), Yoganarasimhan (1996).

Hymenodictyon orixense (Roxb.) Mabb.

Botanical synonyms

Cinchona excelsa Roxb., *C. orixensis* Roxb., *Hymenodictyon excelsum* (Roxb.) Wallich ex Roxb.

Common names

Bengali: latikarum; ***English***: kuthan; ***Gujarati***: amarchhala, bhainchhal, bhramarasalya, boisal, dondro; ***Hindi***: bhaulan, bhenrmal, bhurkur, kukurkat; ***Kannada***: bandara, bataga, dodda thoppe mara, gandele, vilari, yanni; ***Malayalam***: itthilei, ittiyila, malamkal, malankalli, nichan, perantholi, vellakatampu; ***Marathi***: bhoursal, bundaru, dancelo, dondru, kalapachnak; ***Oriya***: bodhika, bodoka, ghono, guli, konoo, rongobodhika; ***Punjabi***: barthoa, kukarhat; ***Sanskrit***: bhramarchhallika, bhringhava, ugragandha; ***Tamil***: peranjoli, sagappu, vellei kadambu; ***Telegu***: bandaru, burja, dadiyetta, dudippa, monnabillu.

Description

A deciduous tree up to 25 m tall, usually with a rounded crown, straight, cylindrical stem, and smooth, greyish-brown bark, soft

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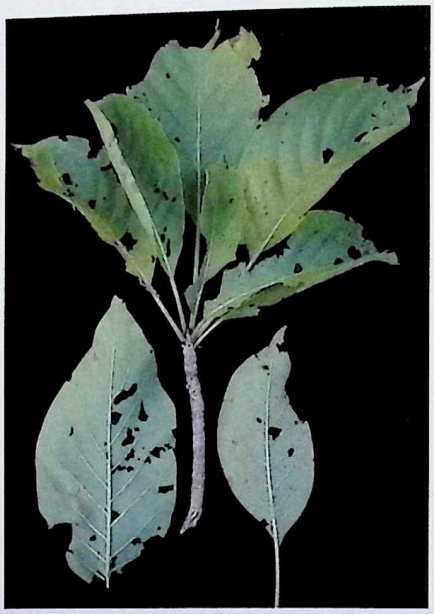
and corky in old stems. Leaves opposite, simple, entire, obovate or ovate to elliptical-lanceolate, 10–25 cm long and 7.5–12.5 cm wide, pubescent on both surfaces, apex abruptly acuminate, narrowed into petiole; lateral nerves 7–10 pairs; petioles 2.5–7.5 cm long; stipules ovate or oblong, usually with tiny tooth-like glands on the serrate margins. Flowers 5 mm long, greenish-white, fragrant, crowded in dense, compound spikes in terminal panicles subtended by a pair of leaf-like bracts; calyx 2.5 mm long, narrowly campanulate, pubescent, lobes 5–6, very short; corolla 5 mm long, pubescent outside, tube narrow cylindrical, limb cup-shaped, lobes 5, short, valvate. Fruits (capsules) brown, ellipsoid, 1.3–2 cm long, on stout decurved pedicels 5–13 mm long, dehiscent; seeds numerous, *c.* 10 cm long and 3.5 mm wide, including the membranous wing extending all around the seed. In central India, flowering occurs mainly in August and September and fruiting from December to March; in this region, leaves turn yellow before being shed in November–December, and trees remain leafless until June. During the dry season, the tree is easily recognized by the persistent panicles of small, brown, reflexed capsules.



Distribution and habitat

Native to tropical Asia from India southwards and eastwards through Myanmar (Burma) and Indochina to Taiwan, the Philippines, Malaysia and Indonesia. In India it is found scattered in deciduous forests throughout most of the country to an elevation of 1500 m. Most common on deep porous soils along the base of hills and on sandy or stony soils or alluvial ground near rivers, and in savannahs.

Medicinal properties and uses

The astringent inner bark is used as a febrifuge and antiperiodic, especially for tertian ague. In Ayurveda it is considered useful for treating tumours. Its decoction is used in Gujarat to relieve diarrhoea. In Purulia District in West Bengal the bark,

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pounded with asafoetida, is applied externally to treat liver ailments. Among the Kol and Saora of Orissa the paste of the root is applied locally to relieve joint pain in gout. The tribal inhabitants of eastern Bihar use a decoction of the stem bark as a prophylactic against malarial fever, and a paste of the bark as an external application for skin diseases. An extract of the root is used to relieve body swelling among the Gonds of Uttar Pradesh. The powdered wood is used to treat herpes in Indochina.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956), CSIR (1948–1992), Jain *et al.* (1989), Jha and Varma (1996), Kirtikar *et al.* (1935), Mukherjee and Namhata (1990), Singh and Prakash (1994), Yoganarasimhan (1996).

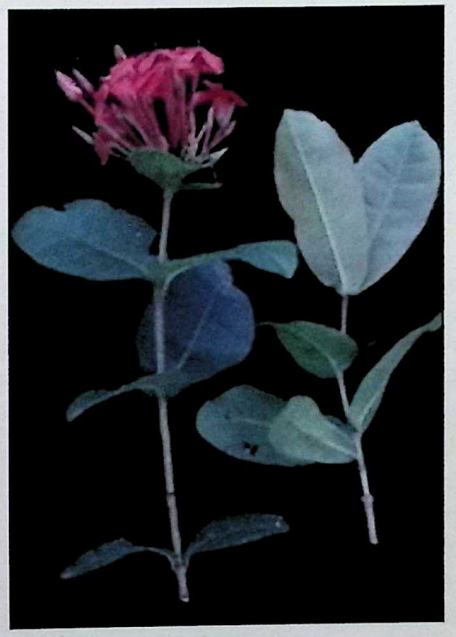
Ixora coccinea L.

Botanical synonym

Ixora bandhuca Roxb.

Common names

Bengali: rajana, rangan, rookmini; ***English***: flame of the woods, jungleflame ixora; ***Hindi***: rajana, rangan, rookmini; ***Kannada***: guddedasal, kepala, kisukare, maale gida; ***Konkani***: patkali; ***Malayalam***: cetti, shekki, techi, thechii, thetti; ***Marathi***: bakora, pankul, pendgul, pentkul; ***Oriya***: bondhuko, romoniphulo; ***Sanskrit***: bandhujivaka, bandhuka, paranti, raktaka; ***Tamil***: chetti, kullai, sedaram, setti, sinduram, vedchi; ***Telegu***: bandhujivamu, bandhukamu, koranam, mankana.



Description

A glabrous shrub, usually 0.6–1 m tall. Leaves opposite, sessile or nearly so, elliptic, ovate or obovate, 5–10 cm long and 3.2–6.3 cm wide, apex obtuse, apiculate or mucronate, base rounded or subcordate; main nerves 8–12 pairs, slender; stipules with a long, rigid, cuspidate point. Flowers numerous, bright scarlet or sometimes pink or yellow, borne in dense terminal corymbose cymes; calyx 2.5 mm long, teeth 1.3 mm long, triangular, acute; corolla tube up to 3.8 cm long, slender, lobes elliptic-oblong, subacute. Fruit (berry) globose, 0.6 cm in diameter, smooth, fleshy, crowned with the calyx teeth, reddish or purplish when ripe; seeds ventrally concave.

Distribution and habitat

Occurs naturally in forests along the western coast of India and in Sri Lanka; commonly planted in gardens throughout the country.

Medicinal properties and uses

In Ayurveda, an infusion of the leaves and stems is considered astringent, antiseptic and sedative; it is used as an external wash to treat infantile skin ailments. The roots, which exude a yellow juice and have an unpleasant rancid odour, are reported to have sedative and stomachic properties

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and are used to treat fever, gonorrhoea, loss of appetite, diarrhoea and dysentery. They are reported to stimulate gastric secretions and bile and to provide relief from abdominal pain. They have astringent and antiseptic properties and are applied externally to promote healing of sores and chronic ulcers. A decoction of the flowers is used as a lotion to relieve eye troubles and for sores, chronic ulcers, scabies and some types of dermatitis; they are used internally to treat cholera, dysentery, gonorrhoea and leucorrhoea. In Siddha, the roots and flowers are used in the treatment of venereal diseases, fever, thirst, leucorrhoea, dysentery and ulcers. The fruits are eaten and the flowers are used as a flavouring.

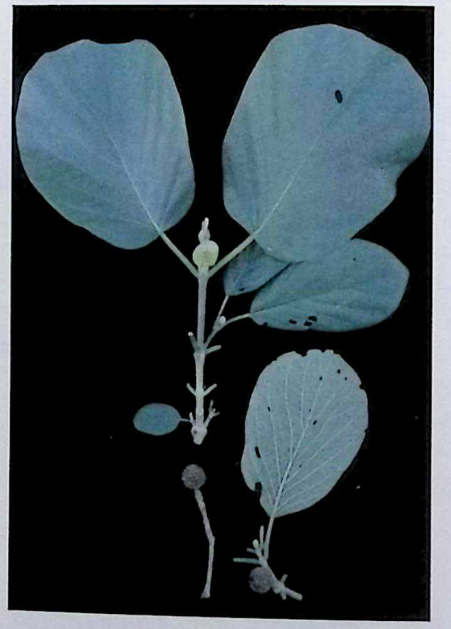
References

Asolkar *et al.* (1992), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

Mitragyna parviflora (Roxb.) Korth.

Botanical synonyms

Nauclea parviflora Roxb., *Stephegyne parviflora* (Roxb.) Korth.



Common names

Bengali: gulikadam; ***Gujarati***: kadamb; ***Hindi***: kadam, kadassa, kaddam, kaim, kalm, kalmi, mundi; ***Kannada***: hedu, kadaga, kadaval, kongu, nayikadambe, sannakadambe; ***Malayalam***: nirkkatampa, sirikatampa, vimba, vimbu nirkadambu; ***Marathi***: kadamb, kalam, kalamb, kuddam; ***Oriya***: gudikaima, mundi, mundi-mundi, mur; ***Punjabi***: kalam, kalkam, kam, keim; ***Sanskrit***: bhumikadamba, dhulikadamba, vitanah; ***Tamil***: chinna kadamba, chinna kadambu, kadambai; ***Telegu***: botruga, bottaganapa, bottakadimi, nir kadambe.

Description

A medium-sized to large deciduous tree with a rounded crown and a short, often fluted, buttressed stem; bark smooth, grey, exfoliating in scales. Leaves variable in size and shape, 5–12.5 cm long and 3.8–7.5 cm wide, elliptic to suborbicular or obovate, glabrous on both sides, apex rounded, acute or bluntly acuminate, base rounded or acute, sometimes cordate; main nerves 6–8 pairs; petioles 1–2 cm long; stipules 13 mm long and 5–8 mm wide, oblong-spathulate, obtuse, parallel-nerved, pink.

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Flowers greenish-yellow or creamy-yellow, fragrant, borne in globose heads 2–2.5 cm in diameter on solitary terminal peduncles; calyx 2 mm long, funnel-shaped; corolla 6.3–8 mm long, lobes 2.5 mm long, triangular-ovate, acute, recurved. Head of fruits 1.3–1.6 cm in diameter, composed of 3-mm-long, oblong capsules with 10 blunt ribs; seeds minute, winged. In central India flowering occurs mainly in June and July; fruits mature the following March–April.

Distribution and habitat

Generally scattered in deciduous forests throughout the drier regions of India, Myanmar (Burma) and Sri Lanka to an elevation of 1200 m in the outer Himalayas. In peninsular India it is found on black cotton soils and alluvial sites near rivers.

Medicinal properties and uses

The bark and root are reportedly used to treat fevers and colic among the Santhalis; the bark, ground and made into a paste, is applied to relieve muscular pains. In Ayurveda, the bark and fruit are used as a substitute for those of *Anthocephalus chinensis* (*Rubiaceae*) to treat burning sensation, poisoning, wounds, gynaecological disorders, cough, oedema, to alleviate *kapha* and *pitta*, and as an aphrodisiac. In Siddha, the stem, bark, leaf, fruit and seed are used as a substitute for those of *Anthocephalus chinensis* to treat eye diseases, dropsy, diseases of *vatam* and urticaria.

References

Chopra *et al.* (1969), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

Mussaenda frondosa L.

Botanical synonyms

Mussaenda belilla Buch.-Ham., *M. glabrata* Hutch. ex Gamble

Common names

Bengali: nagballi; ***Hindi***: bebina, bedina; ***Kannada***: bellotti, billoothi, hasthygidda, ipparati, pathri; ***Konkani***: belloti, daspathry, karabphul, sarvadi; ***Malayalam***: parathole, vellila, vellimayittali; ***Marathi***: bhurtkasi, bhutakesi, bhutkes, lavasat, shivardole; ***Sanskrit***: nagavalli, shrivati; ***Tamil***: vellaiyilai, vellimadandai.

Description

An erect or climbing shrub, or sometimes a small tree, with grey bark and long flexuous, cylindrical, divaricate branches. Leaves 7.5–12.5 cm long and 5–9 cm wide, elliptic-oblong or ovate, apex shortly acuminate, more or less pubescent above, pubescent on the nerves beneath, base rounded or tapering into the petiole; main nerves 8–12 pairs; petioles 0.6–2.5 cm long; stipules paired, 6 mm long, linear-lanceolate, very acute, hairy. Flowers, tubular-funnel-shaped, yellowish-green outside and orange-red within, one calyx

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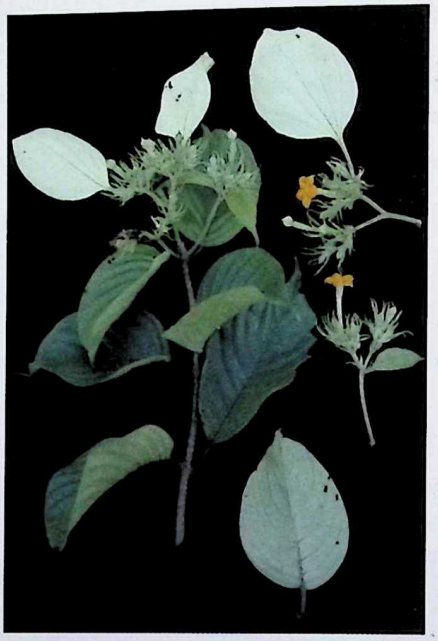
lobe occasionally becoming white and foliaceous, borne in terminal cymes. Fruits (berries) rounded or ovoid, glabrous, 1–1.3 cm in diameter.



Distribution and habitat

Found in tropical Himalayan forests from Dehra Dun eastwards, in the Khasi Hills of Meghalaya, in southern and western regions of the Indian peninsula, and in the Andaman Islands. Commonly cultivated in gardens throughout the tropics.

Medicinal properties and uses

The leaves and flowers are applied externally to promote healing of ulcers. A weak decoction of the dried shoots is given to children to relieve coughs. The bitter root is considered alterative and demulcent and is used in the treatment of leprosy and eye troubles. A decoction of the leaves is reportedly used against intestinal worms. The leaves as well as the foliaceous calyx lobes are eaten cooked as a herb.

References

Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

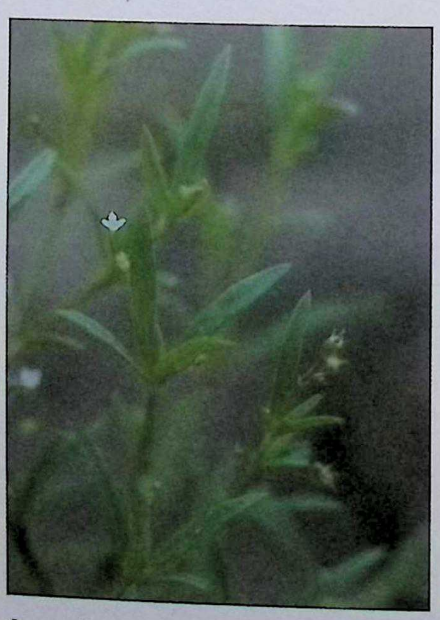
Oldenlandia corymbosa L.

Botanical synonym

Hedyotis corymbosa (L.) Lam.

Common names

Bengali: khet-papra; ***Gujarati***: khet-papra, parpat; ***Hindi***: daman papar; ***Kannada***: kalla sabatrasige; ***Malayalam***: parpatakam; ***Marathi***: khet-papda, papti, paripat; ***Sanskrit***: parapata, parpata, parpataka, parpatakah; ***Tamil***: parpadagam; ***Telegu***: verinellavemu.



Description

A prostrate or suberect annual herb with spreading branches, up to 40 cm tall. Leaves subsessile, 2–4.5 cm long and 1.5–4 mm wide, linear or narrowly elliptic-lanceolate, often with recurved margins, apex acute; stipules short, membranous, truncate. Flowers white or pinkish, solitary or 2–3 together, in axillary pedunculate cymes, bract beneath the pedicels 1.2–1.5 mm long; calyx 2 mm long, pubescent, with narrowly

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triangular teeth; corolla 2.5 mm long, lobes acute, *c.* 1.2 mm long. Fruits (capsules) globose, obovoid or slightly pyriform; seeds pale brown, angular.

Distribution and habitat

Pantropical in distribution, and common throughout India in wet lowlands and in cultivated fields, usually during the rainy season.

Medicinal properties and uses

In Ayurveda, the whole plant is considered to possess cooling, febrifugal, pectoral and stomachic properties; it is an ingredient of several important compound preparations. Usually given in the form of a decoction, it is used to treat remittent fever with gastric irritability and nervous depression caused by deranged bile, and as an anthelmintic. It is reportedly used as a substitute for *Fumaria indica* (*Fumariaceae*) for the treatment of haemorrhage, diarrhoea, vomiting, menorrhagia, burning sensation, distaste, giddiness and intoxication. The powdered plant is eaten with curd (yoghurt) to treat venereal diseases among the Malayalis in North Arcot District, Tamilnadu. In the Konkan, the juice of the plant is applied to palms and soles to relieve burning sensations associated with fevers; its decoction is given internally to treat remittent fever and as a cure for heat eruptions. It is also given to treat jaundice and other liver disorders, and as an anthelmintic.

References

Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935), Sivarajan and Balachandran (1994), Viswanathan (1997), Yoganarasimhan (1996).

Richardia scabra L.

Botanical synonym

Richardsonia pilosa H.B.&K.

Common names

English: false ipecac, undulated ipecac.

Description

A hairy annual herb with prostrate or ascending stems up to 120 cm long. Leaves 1.8–3.6 cm long, elliptic, membranous. Flowers white or pinkish, 0.5 cm long, in terminal dense involucrate heads. Fruit light brown, 0.3 cm long; seeds yellowish.

Distribution and habitat

Native to Brazil. Introduced to Shillong (Meghalaya) and currently cultivated and naturalized in many parts of India.

Medicinal properties and uses

The root possesses emetic and diaphoretic properties. The source of *undulated* or *farinaceous ipecac*, it is sometimes used as a substitute or adulterant of true ipecac (from *Cephaelis ipecacuanha*: *Rubiaceae*).

References

CSIR (1948–1992),Yoganarasimhan (1996).

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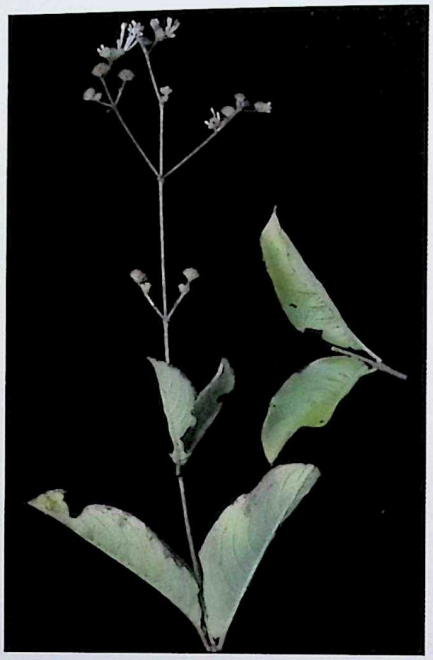
Spermadictyon suaveolens Roxb.



Botanical synonym

Hamiltonia suaveolens Roxb.

Common names

Marathi: gidasawa, gidesa; ***Oriya***: janamirgiri, pitondi; ***Punjabi***: fisauni, kanera, kantulu, muskei, tulenni; ***Telegu***: kondamuritidi.

Description

A shrub up to 3.5 m tall with shining grey bark peeling off in papery flakes. Leaves opposite, rigid, with a fetid odour when crushed, 12.5–20 cm long and 3.8–9 cm wide, elliptic-lanceolate, apex acute, base acute, more or less hairy on the nerves beneath; reticulately veined, main nerves 10–16 pairs, arcuate; petioles 1.3–2 cm long; stipules triangular, hairy. Flowers blue or white, fragrant but with a fetid odour when crushed, borne in subglobose heads in terminal branched panicles; calyx 3–4 mm long, hairy, tube narrow, teeth 4–5, linear-lanceolate; corolla up to 1.3 cm long, pubescent outside, tube slender, lobes 4–5, ovate, acute. Fruit an ellipsoid, 5-valved capsule 3–6 mm long; seeds 3-angled with a loose, arillate lace-like covering. In central India flowering occurs between November and January.

Distribution and habitat

Occurs naturally in the tropical and subtropical Himalayas to an elevation of 2000 m, in central and west peninsular India, and in China. In peninsular India it is found in dry, open and forested habitats on rocky soils, especially on trap, to an elevation of 1300 m. Frequently cultivated in gardens.

Medicinal properties and uses

The plant is used with mustard oil as an application for wounds by the Mundas in Ranchi district (Bihar). The ground bark is used as an external application on the body for treating puerperal fever. The root is used in the treatment of diarrhoea, and its infusion for courbature. The root, ground in cow's milk with black pepper, is used as an oral contraceptive by women in the Gandhamardan Hills of Orissa.

References

Brahmam and Saxena (1990), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

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Tarenna asiatica (L.) O. Kuntze ex K. Schum.

Botanical synonyms

Chomelia asiatica (L.) Kuntze, *Rondeletia asiatica* L., *Webera corymbosa* Willd.

Common names

Bengali: kankra; ***Kannada***: tarani; ***Oriya***: jhanjhauka; ***Telegu***: komi.

Description

A large, evergreen shrub or a small tree, up to 6 m tall, with smooth, greyish-brown bark; young parts covered with a resinous exudate which dries bright greenish-yellow. Leaves elliptic or oblong-lanceolate, coriaceous, about 15 cm long, apex acute; lateral nerves prominent beneath; petioles *c.* 1.5 cm long. Flowers white, fragrant, borne in terminal trichotomous cymes. Fruits (berries) globose, pea-sized, glabrous, black when ripe; seeds 6–10, black.

Distribution and habitat

Found in western peninsular India from Konkan (Maharashtra) southwards to an altitude of 1000 m, and in the North Cachar Hills of Assam. Common in dry deciduous forests of Karnataka.

Medicinal properties and uses

The crushed fruit is applied to boils to promote suppuration. The leaves are reportedly used to treat skin diseases.

References

Chopra *et al.* (1956), CSIR (1948–1992), Yoganarasimhan (1996).

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Rutaceae

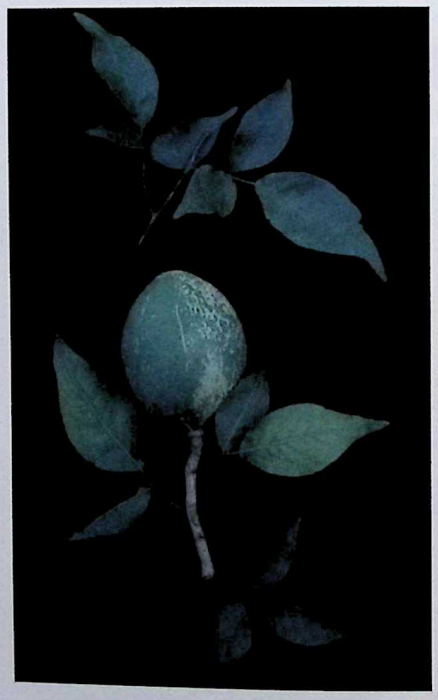
Aegle marmelos Corr. ex Roxb.

Botanical synonyms

Belou marmelos (L.) Lyons, *Bilacus marmelos* (L.) Kuntze, *Crataeva marmelos* L.

Common names

Bengali: bel, bela, vilva; ***English***: bael tree, Bengal quince; ***Gujarati***: bili; ***Hindi***: bael, bel; ***Kannada***: bela, bilva, kumbala, malura; ***Konkani***: bel, bello; ***Malayalam***: kovalam, kuvalam, mavilavu, vilvam; ***Marathi***: bael, bel; ***Oriya***: baelo, belo, bilwa, sripholo; ***Sanskrit***: bilva, bilvah, malura, sriphal, vilvah; ***Tamil***: bilva, villuvam, vilva; ***Telegu***: bilavamu, maredu; ***Urdu***: bel.



Description

A small, deciduous tree, 6–7.5 m in height, with a somewhat fluted bole; bark soft, corky, light grey, exfoliating in irregular flakes. Older branches armed with straight, sharp, single or paired, axillary spines 2.5 cm long; young branches green, slightly zig-zag and compressed. Leaves alternate, attenuate, trifoliate, occasionally digitately 5-foliate; petiole 2–4 cm long, slender with a slightly swollen base. Leaflets ovate or ovate-lanceolate, margins crenate, apex acuminate, glabrous, densely minutely glandular-punctate on both surfaces, emitting a spicy fragrance (like limonene) when crushed; lateral leaflets to 7 cm long and 4.2 cm wide, petiolules 0–3 mm long; terminal leaflets to 7.5 cm long and 4.8 cm wide, petiolules up to 1.5 cm long. Flowers large, greenish-white, sweet-scented, in short axillary panicles 4–5 cm long. Fruits globose, grey or yellowish, up to 20 cm in diameter, with a woody rind; seeds numerous, oblong, compressed, embedded in sacs covered with thick, orange-coloured, sweet pulp. Several varieties are recognized, distinguished by the shape and size of their leaflets and fruit texture; wild types typically have small, hard, round, astringent and unpalatable

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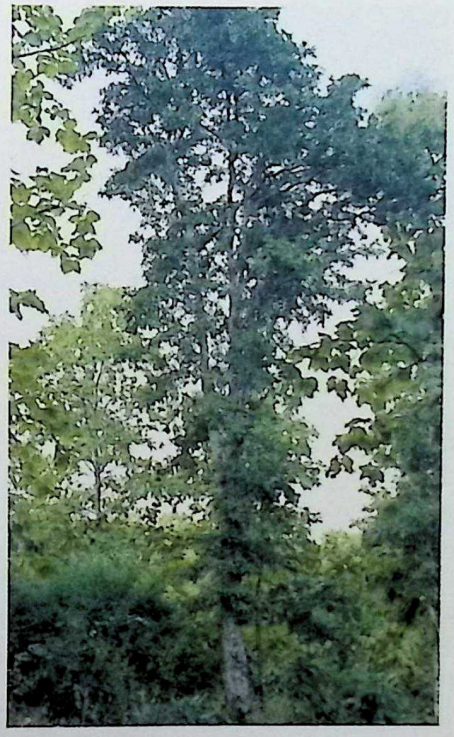
fruits with numerous seeds. In central Indian deciduous forest regions, flowering occurs from May to July; fruits ripen in May and June of the following year.

Distribution and habitat

Found throughout India, usually scattered, in dry deciduous forests of peninsular India, and at elevations up to approximately 1200 m in the Western Himalayas. The tree is both drought-hardy and frost-tolerant and grows well on a wide variety of soils in areas receiving between 570 and 2000 mm annual rainfall. Extensively planted near Hindu temples for its leaves and wood, which are used for religious ceremonies, and for its edible fruits, which are valued in Ayurvedic and other indigenous medical systems.



Medicinal properties and uses

Considered an auspicious tree by Hindus, the fruits, roots, bark, leaves and seeds are valued in traditional Indian medicine. The ripe fruits are eaten fresh, its aromatic pulp typically diluted with water and sweetened with tamarind to make a delicious cooling drink; in northern India they are used to make a preserve known commercially as *Morabba*. The tender unripe fruits have astringent, digestive and stomachic properties and are used to promote digestion and strength, and to treat colic and diarrhoea. In Andhra Pradesh, the Gonds eat the pulp of the unripe fruits to treat dysentery. The root, usually the basal portion of the stouter lateral roots or, in Kerala, the entire root or wood of the larger roots, is an ingredient of the Ayurvedic drug known as *Dasamula*. The roots as well as the bark are used in the form of a decoction as a remedy for melancholia, hypochondriasis, intermittent fevers and palpitation of the heart. In pharmacological trials, both the fruits and roots exhibited anti-amoebic and hypoglycaemic properties. The leaves are bitter and are used as a febrifuge. Among the tribal and rural inhabitants of Bhavnagar District in Gujarat, the leaf juice is used for treating diabetes. A poultice of the leaves is used to treat ophthalmia and ulcers. Fresh leaves are used in West Bengal as a remedy for dropsy, and beri-beri associated with weakness of the heart. The diluted leaf-juice is used to treat catarrh, and applied externally to promote healing of abscesses; mixed with butter, the leaf-juice is applied to cure mouth sores by the Gonds and Kolams of northern Andhra Pradesh.

References

Asolkar *et al.* (1992), Bhatt and Mitaliya (1999), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935), Ravisankar and Henry (1992), Seetharam *et al.* (1999), Sivarajan and Balachandran (1994).

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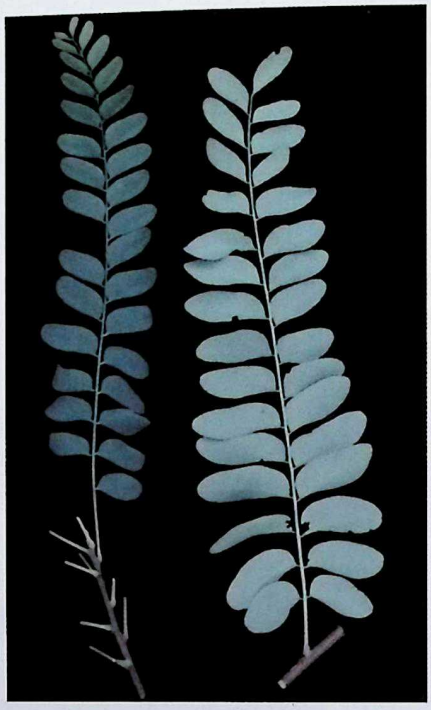
Chloroxylon swietenia DC.



Botanical synonym

Swietenia chloroxylon Roxb.

Common names

English: Indian satinwood tree; ***Gujarati***: bheria, billu; ***Hindi***: bhera, bherul, bhirra, dhoura, girya, rakata-rohidi; ***Kannada***: bittula, hurugulamare, mashalda; ***Marathi***: bheria, billu, halda; ***Oriya***: bheru, biluga; ***Sanskrit***: bhillotaka, bimbilota; ***Tamil***: karumboraju, kudavuboraju, poraju, purush; ***Telegu***: billu, billuakulu, billubanka, tella-bitlu.

Description

A medium-sized deciduous tree, up to 15 m tall, with a short straight, clear bole and spreading crown; bark thick, corky, rough, furrowed, pale yellow or light grey, aromatic. Leaves alternate, pinnate, 12–24 cm long, aromatic; leaflets 10–20 pairs, oblong, unequal-sided, gland-dotted, 1.5–3 cm long and 0.6–1.5 cm wide. Flowers white or cream-coloured, borne in terminal or axillary, pyramidal panicles to 15 cm long. Capsules oblong, glabrous, 2.5 cm long, dark brown when ripe, dehiscent; seeds oblong, brown, winged. The tree is usually leafless from February to April. Flowering occurs mainly in March and April, and fruiting from May to August.

Distribution and habitat

Commonly found in the dry, deciduous forests of peninsular India as far north as the Satpura hills and Chota Nagpur, on sites receiving an annual rainfall of 750–1500 mm. It grows on bare rocky ground and on poor soils that are well-drained with a large proportion of sand or gravel. In many localities it is typically associated with *Soymida febriguga* (*Meliaceae*).

Medicinal properties and uses

A decoction of the stem bark is astringent, and is used externally to treat contusions and painful joints; it is also given to alleviate fever and to treat chest pain among the tribal inhabitants of southern Bihar. Among the Gonds of Uttar Pradesh, a decoction of the stem bark, together with that of *Mangifera indica* (*Anacardiaceae*), *Madhuca indica* (*Sapotaceae*), and the leaves of *Holoptelea integrifolia* (*Ulmaceae*) and *Dendrocalamus strictus* (Poaceae) is used as a bath to treat jaundice. In tribal communities of Prakasam District in southern Andhra Pradesh, a preparation composed of the stem bark and that of *Azadirachta*

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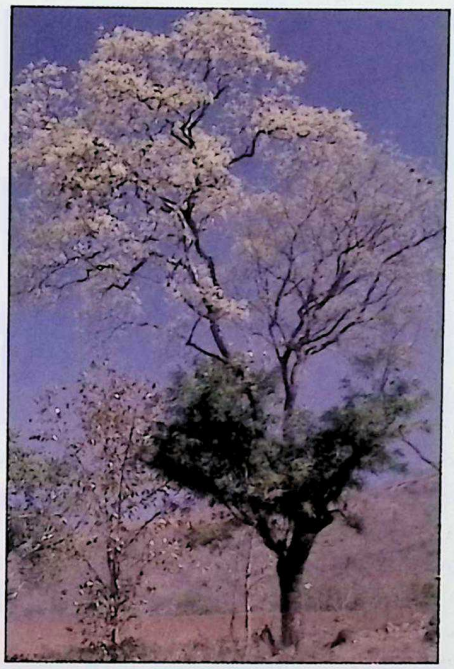

indica (*Meliaceae*) and *Derris indica* (*Fabaceae-Papilionoideae*) is taken orally after childbirth as an antiseptic and general tonic; in this region, the powdered gum obtained from the cut bark is given with water in the treatment of diabetes, The leaves are made into a paste and applied externally to promote healing of boils, blisters and wounds, and to treat arthritis. A paste of the leaves and root in equal parts is taken internally to relieve headache or applied externally to the forehead as a balm by tribal inhabitants of Bastar District (Madhya Pradesh).

References

Asolkar *et al.* (1992), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Girach and Aminuddin (1995), Hemadri and Rao (1989), Kirtikar *et al.* (1935), Singh and Prakash (1994, 1998), Vijaya Kumar and Pullaiah (1998).

Limonia acidissima L.

Botanical synonyms

Anisifolium limonia (L.) Kurtze, *Feronia elephantum* Correa, *F. limonia* (L.) Swingle, *Hesperethusa acidissima* (L.) Roem., *Schinus limonia* L.

Common names

Bengali: kait, katbel; ***English***: elephant apple, wood apple; ***Gujarati***: kavit, kotha, kothi, kothun; ***Hindi***: katbel, kavitha, vilatti; ***Kannada***: bela, belada, bilwar; ***Konkani***: kavit, thana; ***Malayalam***: dadhiphala, manmatham, vila, vilatti; ***Marathi***: kauth, kavatha, kavith, kovit; ***Oriya***: kaitha, koitho, koithobelo, koito; ***Punjabi***: bilin, kait; ***Sanskrit***: kapittha, kapitthah; ***Tamil***: karuvila, kuttvila, narivila, vila; ***Telegu***: kapitthamu, pushpaphalamu, velaga; ***Urdu***: kaitha.

Description

A small to medium-sized deciduous tree with a straight trunk and more or less oval or rounded crown; bark whitish to pale or dark grey; lower branches armed with hard, axillary spines 1.2–3.7 cm long.

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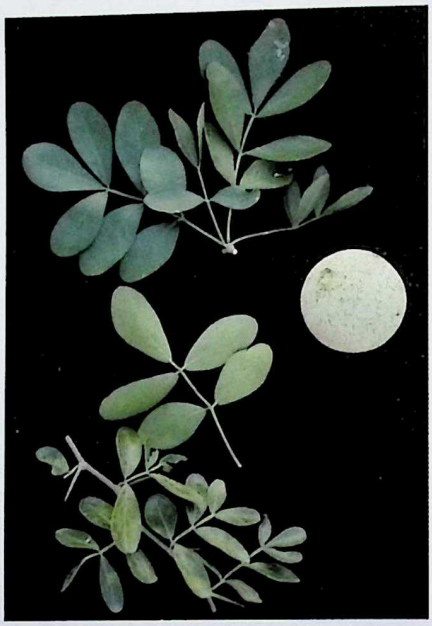
Leaves alternate, imparipinnate, smelling of anise-seed when crushed; petiole and rachis flat, often winged; leaflets 3–9, opposite, 2.5–5 cm long and 1.2–2.5 cm wide, cuneate or obovate, apex obtuse, often crenulate, margins entire; lateral leaflets sessile. Flowers small, numerous, pale yellowish-green or dull red, borne in terminal or axillary panicles, male and female flowers often in the same panicle; calyx small, 5-lobed, lobes triangular; petals 5–6, free, elliptic-oblong, 5 mm long, spreading or deflexed. Fruit 5–8 cm in diameter, globose, with a grey, woody rind (pericarp); seeds numerous, embedded in a soft, brown, strong-smelling, mealy pulp. Depending on locality, flowering occurs between February and June; fruits mature between September and December.



Distribution and habitat

Native to southern India, Sri Lanka and Java; cultivated for its fruits throughout the plains of India, especially in the drier zones.

Medicinal properties and uses

The fruit is considered tonic, antiscorbutic, alexipharmic, astringent, stomachic and stimulant. Its pulp, as well as the powdered rind of the fruit, is applied externally as a remedy for the bites of venomous insects and reptiles. The unripe fruit paste is taken orally to check diarrhoea in southern Orissa. The bark is prescribed for biliousness. The leaves are aromatic, astringent and are used to treat digestive troubles in children. Among the tribal inhabitants of western Maharashtra, the leaf juice mixed with a pinch of black pepper is taken as a carminative. An oil obtained by crushing the leaves is used to relieve itching. The pulp of the fruit is used to make jelly, chutney, and a pleasant drink.

References

Chopra *et al.* (1956, 1969), Kirtikar *et al.* (1935), Mohanty *et al.* (1996), Upadhye *et al.* (1994).

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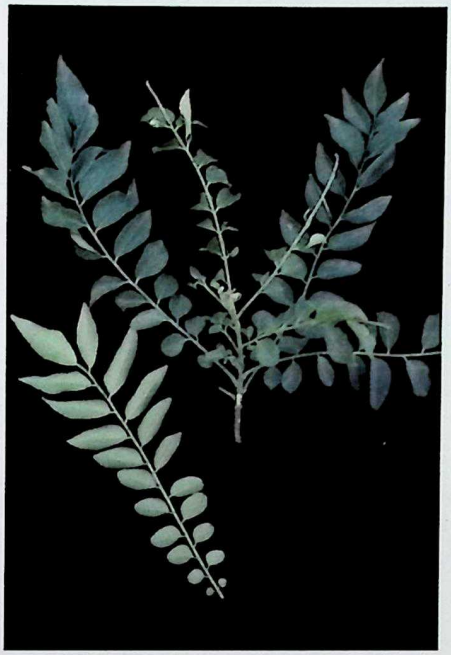
Murraya koenigii (L.) Spreng.

Botanical synonyms

Bergera koenigii L., *Chalcas koenigii* (L.) Kurz, *Murraya foetidissima* Teijsm. & Binnend

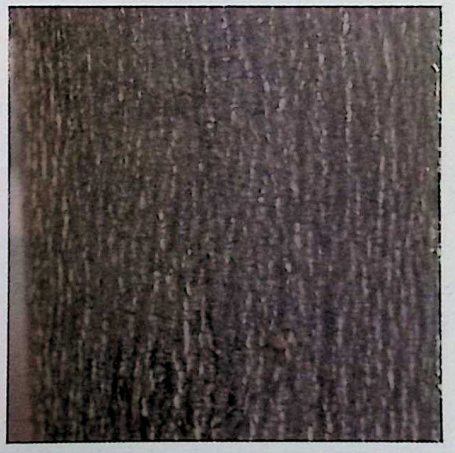


Common names

Bengali: barsunga, kariaphyli; ***English***: curry bush, curry leaf tree; ***Gujarati***: goranimb, kadhilimbdo, mitholimbdo; ***Hindi***: barsanga, gandhela, harri, kathnim, mitha nim; ***Kannada***: gandhabevu, karibevana, karibevu; ***Malayalam***: kariveppu; ***Marathi***: gandla, jhirang, karhinimb, poospala; ***Oriya***: basango, bhursunga, marisingipotoro, mersinga, sanomorisingi; ***Punjabi***: bowala, gandalu, gandanim, gandla; ***Sanskrit***: kaidaryah, surabhinimba; ***Tamil***: karivevempu, karuveppilai, kattaveppilei; ***Telegu***: karepahu, karivepaku.

Description

A large shrub or small evergreen or deciduous tree to 5 m tall with a short trunk, thin, smooth, grey or brown bark and a dense, shady crown. Most parts of the plant are covered with fine down and have a strong, peculiar smell. Leaves pinnately compound, 15–30 cm long, arranged spirally, crowded on the ends of branchlets, rachis terete, pubescent, petioles 1.2–1.5 cm long; leaflets 11–25, alternate on rachis, 2.5–3.5 cm long, ovate-lanceolate with an oblique base, margins irregularly crenate, pubescent beneath, petiolules 2–3 mm long. Flowers white, 0.8–1 cm long, numerous in broad terminal clusters, calyx pubescent, lobes triangular, subacute; petals 6 mm long, linear-oblong, rounded at apex, gland-dotted. Fruits (berries) ovoid to subglobose, wrinkled or rough with glands, to 2.5 cm long and 0.8 cm in diameter, purplish-black when ripe; 2-seeded. Flowers mainly between February and April, and fruits between April and August, depending on locality.



Distribution and habitat

Native to tropical Asia from the Himalayan foothills of India to Sri Lanka eastwards through Myanmar (Burma), Indochina, southern China and Hainan. Frequently cultivated throughout India and elsewhere in the tropics for its leaves, used to flavour curries; sometimes naturalized outside its native range.

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Medicinal properties and uses

The plant is highly valued for its leaves, an important ingredient in Indian cuisine, to promote appetite and digestion. In Ayurveda, they enter into several important compound preparations, and are considered useful for destroying pathogenic organisms and poisons, and treating skin diseases, worm infestation and neurosis. The raw green leaves or their decoction are taken orally to treat dysentery and as a febrifuge. Crushed leaves are applied externally to cure skin eruptions and to relieve burns. The bark and roots are used as stimulants, and are applied externally to cure skin eruptions and to treat the bites of poisonous animals.

References

Chopra *et al.* (1956, 1969), Kirtikar *et al.* (1935), Mohanty *et al.* (1996), Sivarajan and Balachandran (1994).

Murraya paniculata (L.) Jack

Botanical synonyms

Chalcas paniculata L., *Murraya exotica* sensu Trimen. *M. odorata* Blanco, *M. sumatrana* Roxb.

Common names

Bengali: kamini; ***English***: honeybush, orange jasmine; ***Hindi***: bibsar, juti, kamini, marchula; ***Kannada***: angarakana, karibevu, pandry; ***Konkani***: pandhri; ***Marathi***: kunti, marchulajuti, pandari; ***Oriya***: banmallika, birijugi, dhodamahulia, harkankali, pondoka; ***Sanskrit***: ekangi, muramamsi; ***Tamil***: kariveppilai, konji, panjandali, simaikkonji, vangarai; ***Telegu***: ganarenu, karepaku, nagagolunga.

Description

A handsome evergreen shrub or small tree with a spreading crown and short, often crooked, trunk; bark pale yellowish-brown to white, thin, rather corky, fragrant. Leaves alternate, imparipinnate, 10–17 cm long; leaflets usually 3–5, mostly 3–7 cm long, ovate or elliptic-lanceolate or rhomboid, glossy and darker above, gland-dotted, base cuneate or rounded. Flowers white, fragrant, borne in axillary, few-flowered, corymbose cymes. Fruit an oblong or ovoid berry, red or deep orange when ripe, containing 1–2 seeds.

Distribution and habitat

Native to tropical Asia from India and Sri Lanka to Myanmar (Burma), southern China and Taiwan, Thailand, and eastwards throughout the Malesian region to northeastern Australia and New Caledonia. Found throughout India and the Andaman Islands to an altitude of 1500 m. Commonly grown in gardens for its attractive glossy green foliage and large clusters of fragrant flowers. It is a popular hedge plant, well adapted for topiary work.

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Medicinal properties and uses

The leaves are stimulant and astringent; they are reportedly used in the form of an infusion to treat diarrhoea and dysentery in the Philippines. The powdered leaves are applied to cuts to promote healing; their decoction is taken internally to treat dropsy. Among the Baigas of northeastern Madhya Pradesh, the crushed leaves are made into a paste and mixed with molasses to make tablets that are taken orally to treat joint pains; the leaves, cooked with mustard or sesame oil along with dried ginger, are applied externally to relieve inflamed joints. The warm leaf paste is applied externally to promote the healing of broken bones among the Paudi Bhuinya in northern Orissa. In the Gandhamardan Hills of Orissa, the leaves and twigs are boiled to make a bath that is used to relieve stomach-ache in children and rheumatic pains in adults. The leaves and root bark are sometimes used to treat rheumatism, coughs and hysteria. The root bark is reportedly taken internally and used as an external rub to relieve body-aches. The bark of both the stem and roots is used as an antidiarrhoeal. The twigs are used for cleaning teeth. The leaves possess antibiotic activity against *Micrococcus pyogenes* var. *aureus* and *Escherichia coli*.

References

Aminuddin and Girach (1996), Brahmam and Saxena (1990), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Verma *et al.* (1995).

Naringi crenulata (Roxb.) Nicholson

Botanical synonyms

Hesperethusa crenulata (Roxb.) M. Roem., *Limonia acidissima* auct non L., *L. crenulata* Roxb.

Common names

Hindi: beli; ***Kannada***: arunamullu, betaruhi, kadubela, nayibela; ***Malayalam***: kattunarakan, serakuttunarakan; ***Marathi***: kawat, naibel, tondsha; ***Oriya***: bhenta; ***Sanskrit***: bilvaparni, surasi, vilvaparni; ***Tamil***: billuvamaram, kurangu, kuttivila, magavivam, nayelumichai; ***Telegu***: kukkavelaga, tollivellam, torelaga, tottelaga.

Description

A small, glabrous, spiny, more or less deciduous shrub or small tree up to 6 m tall; bark

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sandy-coloured, rough; spines single or occasionally paired, straight, to 2.5 cm long. Leaves compound, 2.5–10 cm long; leaflets 3–7, trapezoid-ovate, 2.5–5 cm long and 1.2–2.5 cm wide, apex obtuse, notched, base obtuse, margins crenate, to 5 cm long and 2 cm wide; petiole and leaf rachis are jointed, winged. Flowers borne in few-flowered, pubescent, terminal or axillary umbellate cymes up to 2.5 cm long; calyx small, glandular, lobes 4, broadly ovate; petals 4 glandular, 6 mm long, elliptic-oblong. Fruit (berry) globose, bluish-black, 0.8 cm in diameter, very acid-tasting; seeds 1–4, subglobose, *c.* 0.5 cm wide, pale orange-brown.

Distribution and habitat

Native to tropical Asia from Pakistan, India and Sri Lanka to Myanmar (Burma), Indochina and southern China. Found in western and southern peninsular India, as well as in Bihar, West Bengal and Assam; cultivated elsewhere. In Karnataka, it is common in deciduous forests throughout the State.

Medicinal properties and uses

The root has purgative and sudorific properties, and is used in the treatment of colic and cardialgia. The dried fruit is considered tonic and diminishes intestinal fermentation; it is thought to increase resistence to contagious diseases such as smallpox and pestilent fevers, and to be an antidote to various poisons. The leaves are considered to be a remedy for epilepsy. Among the Sahariyas of northwestern Madhya Pradesh, the boiled bark is made into a paste and applied to resolve boils. The Sahariyas also use the dried, powdered root to relieve stomach-ache.

References

Kirtikar *et al.* (1935), Sikarwar and Kaushik (1992).

Ruta graveolens L.

Common names

Bengali: ermul, ispund; ***English***: garden rue, rue; ***Gujarati***: sadab, satapa; ***Hindi***: pismarun, sadab, satari; ***Kannada***: kavunanju, nagadali, sabadu; ***Malayalam***: aruta, somarayen; ***Marathi***: satapa; ***Oriya***: maruya; ***Punjabi***: katmal, sudah; ***Sanskrit***: sadapaha, somalata; ***Tamil***: aruvadam, arvada, pambugolli; ***Telegu***: aruda, sadapa; ***Urdu***: sudah..

Description

A strong-scented, erect, glabrous herb, 30–90 cm high. Leaves 2–3-pinnate, segments spathulate-oblong to linear-oblong, covered with a bloom and strongly aromatic. Flowers small, yellowish, borne in spreading corymbs; pedicels longer than the capsule; bracts lanceolate; sepals triangular, acute; petals oblong-lanceolate, abruptly clawed with dentate or wavy margins. Capsules obtuse with wavy lobes, shortly-pedicelled; seeds angled.

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Distribution and habitat

Probably native to Iran or the Mediterranean region; cultivated in Indian gardens.

Medicinal properties and uses

The herb is considered to be an emmenagogue, stimulant, irritant, abortifacient and acro-narcotic poison. The dried leaves are used as a fumigatory for children suffering from catarrh; powdered and in combination with aromatics, they are given for dyspepsia. A tincture prepared from the fresh leaves is used externally for treating the first stages of paralysis. It may be given internally for treating hysteria, amenorrhoea and epilepsy. The juice of the herb is reported to relieve earache and toothache, and is used as a local application to treat rheumatism of joints, feet and loins. Distillation of the fresh plant material yields a pale yellow or greenish volatile oil (*rue* oil), used externally as a rubefacient. The leaves of the herb are used as a condiment and garnish. They are sometimes pickled and used for flavouring foods and beverages.

Warning

The herb and the distilled oil act as stimulants, chiefly of the uterine and nervous systems; in all forms it is considered injurious to pregnant women. In large doses, the oil is poisonous.

References

Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

Toddalia asiatica (L.) Lam.

Botanical synonyms

Paullinia asiatica L., *Scopolia aculeata* Sm., *Toddalia aculeata* Pers., *T. nitida* Lam.

Common names

Bengali: kadatodali; ***English***: forest pepper, lopez tree, wild orange tree; ***Hindi***: dahan, janglikalimirch, kanj; ***Kannada***: kaduhakukare, kadumenasu, kaypele, macimullu, pargiballi; ***Malayalam***: kakkattuttali, karamullu, kattaukarimilakui, mulakutanni, tutali; ***Marathi***: junglikalimirchi, limri, manger; ***Oriya***: hanomoriso, tundapara, tundopoda, tundupara; ***Sanskrit***: dahana, kacana, kancanah, kanchana; ***Tamil***: kattumilagu, kichilikaranai, milagaranai, mullukkaranai, surai; ***Telegu***: kondakashinda, kondamirepu, merapugandra, mirapakondra, mullamorinda, vanakasinda.

Description

An evergreen climber with rambling stems up to 15 m high and 10 cm in diameter; bark pale brown, with numerous conspicuous circular lenticels and small hooked prickles about 2.5 cm long; inner bark pale yellow mottled with orange, turning

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pinkish-brown on exposure. Leaves alternate, digitately trifoliate; petioles 1.5–3 cm long; leaflets sessile, 5–10 cm long and 1.8–3.8 cm wide, obovate-oblong or oblong, margins crenulate, apex bluntly acuminate, base acute, glabrous, coriaceous, dark shining green above with many inconspicuous, slender, parallel nerves beneath, midrib sometimes prickly beneath. Flowers polygamous, 0.4–0.6 cm in diameter, pale greenish-yellow, in axillary and terminal pubescent panicles 2.5–6.3 cm long. Fruit 7.5–12 mm in diameter, subglobose, fleshy, with 3–5 shallow grooves, yellow to orange when ripe; seeds several, reniform, surrounded by a colourless mucilage and fleshy endosperm.

Distribution and habitat

Native to tropical Asia from India and Sri Lanka to Malesia; also occurs naturally in Mauritius and Madagascar. Found almost throughout India to an altitude of 2500 m. In south India, the plant is very common in the Nilgiri and Palni Hills, and also in the scrub forests of Orissa. In the plains, particularly in dry situations, the plant assumes the form of a low shrub with smaller and narrower leaflets.

Medicinal properties and uses

The root bark is aromatic, bitter, pungent, tonic and antiperiodic, credited with diaphoretic, stomachic and antipyretic properties. In the past it was used medicinally in Europe under the name *Lopez root* or *Cortex radicis*. It is considered to be a potent antimalarial drug and is said to have

both antipyretic and antiperiodic effects similar to those of the alkaloids in *Cinchona* species. An infusion of the fresh root bark is a stimulating tonic and carminative. The root bark is also used in cases of diarrhoea and to treat debility during convalescence after febrile and other exhausting diseases. The fresh leaves are sometimes eaten to relieve pain in the bowels. A decoction of the leaves and stems is used to control fevers by the Irulars of Tamilnadu; the fresh fruits are also eaten to reduce fever and relieve headache. Unripe fruits and roots are rubbed with oil to prepare a stimulating liniment for use in treating rheumatism. The juice of the flowers is sometimes applied to wasp stings, reportedly giving immediate relief. The ripe berries are as pungent as black pepper and are pickled.

References

Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Ragupathy and Mahadevan (1991).

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Santalaceae

Osyris quadripartita Salz ex Decne.

Botanical synomyms

Osyris arborea Wall. ex DC., *O. wightiana* Wall. ex Wight

Common names

English: Nepal tree; ***Kannada***: baingani, kuriganda, natadike, tamparal; ***Marathi***: lotal, popli.

Description

An evergreen shrub or a small tree up to 3 m high, partially parasitic on other plants; branchlets sharply 3-angled. Leaves alternate, 2.5–5 cm long and 1.3–2.5 cm wide, very variable in shape, elliptic-lanceolate or obovate-oblong, apex obtuse, acute or mucronate, base cuneate, sessile. Flowers minute, yellowish-green, polygamous, solitary or in 5–10-flowered axillary umbels; peduncles 0.5–1.3 cm long, flattened. Fruit (drupe) subglobose, about 0.8 cm in diameter, nearly dry, crowned by the disc, yellow turning red when ripe. Flowers and fruits throughout the year, depending on locality, but mainly between January and February in central India.

Distribution and habitat

Found in the subtropical Himalayan hills and outer Himalayas from Kangra (Himachel Pradesh) eastwards to an altitude of 2100 m, in Assam, Myanmar (Burma), Madhya Pradesh, and in southwestern India above

600 m elevation, and in Sri Lanka. Occurs elsewhere in tropical and subtropical Asia, Europe and Africa.

Medicinal properties and uses

An infusion of the leaves is a powerful emetic.

References

CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

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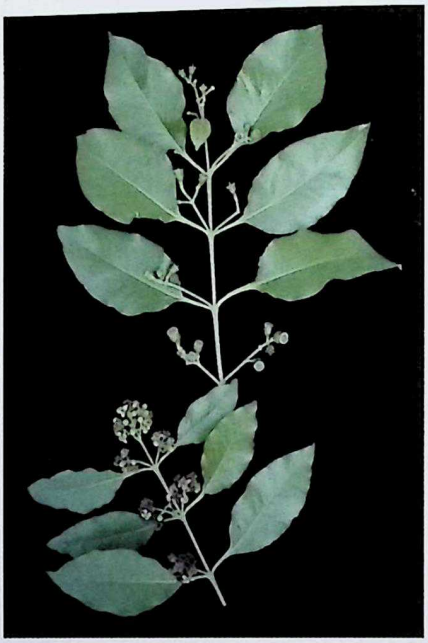
Santalum album L.



Botanical synonym

Sirium myrtifolium Roxb.

Common names

Bengali: chandan, peetchandan, srikhanda, sufaid-chandan; ***English***: sandalwood tree; ***Gujarati***: sukhad, sukhet; ***Hindi***: chandan, safed-chandan, sandal; ***Kannada***: agarugandha, bavanna, bhandrasri, gandha, srigandha; ***Malayalam***: chandanam; ***Marathi***: chandan, gandhachakoda; ***Oriya***: chondono, gondassaro, moloyogo, ogory; ***Punjabi***: chandan, safed-chandan; ***Sanskrit***: candana, chandana, srigandha, srikhanda; ***Tamil***: ingam, kulavuri, sandanam, srigandam, ulocidam; ***Telegu***: chandanamu, chandanapuchettu, chandanum; ***Urdu***: sandalsafed.

Description

A small to medium-sized, evergreen, semi-parasitic tree up to 18 m tall with slender branches and drooping branchlets; bark reddish or dark grey, rough, with deep vertical cracks on old trees. Leaves opposite, thin, glabrous, elliptic-ovate or ovate-lanceolate, 1.5–8 cm long and 1.6–3.2 cm wide. Flowers straw-coloured, brownish-purple, reddish-purple or violet, unscented, borne in terminal and axillary branched cymes. Fruit (drupe) globose, 1.3 cm in diameter, purple-black, with a hard, ribbed endocarp; seeds globose or obovoid.

Distribution and habitat

Probably indigenous to peninsular India, although some authorities believe it to have been introduced from Timor (Indonesia) at least 2500 years ago. Commonly found in dry and moist deciduous and semi-deciduous forests of peninsular India from the Vindhya Range in Madhya Pradesh southwards, especially in Karnataka and Tamilnadu to an altitude of 1200 m. It has been introduced into Rajasthan, parts of Uttar Pradesh and Orissa, where it has become naturalized in some localities.

Medicinal properties and uses

Sandalwood is one of the oldest known perfumery materials in the world. The tree is held sacred by Hindus and is mentioned in Indian mythology, folklore and scripture dating from 300–400 BC. The wood is highly valued for carving; finely ground, it is used

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in incense, and made into a paste and applied to the forehead in Hindu religious ceremonies. The heartwood and the essential oil extracted by steam distillation from the heartwood and large roots have long been used medicinally in India. They are credited with cooling, sedative, diaphoretic, resolvent, tonic, diuretic and expectorant properties. A paste of the wood is applied externally to treat skin diseases, inflamed swellings and ulcers, to relieve burns, allay heat, and to the forehead and upper eyelids to relieve headache and fevers. A decoction of the wood, mixed with that of dry ginger, is useful for treating haemorrhoids. The oil was formerly prescribed for the treatment of gonorrhoeal urethritis and cystitis. Today it is widely used in perfumes and cosmetics and, mixed with twice the quantity of mustard oil, for resolving facial pimples. The seed oil is also used to treat skin diseases.

References

Chatterjee and Pakrashi (1991), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935), Sivarajan and Balachandran (1994), Yoganarasimhan (1996).

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Sapindaceae

Allophylus cobbe (L.) Raeuschel

Botanical synonyms

Allophylus distachys (DC.) Radlk., *A. racemosus* (L.) Boerl., *A. serratulatus* Radlk., *Ornitrophe cobbe* L., *Schmidelia racemosa* L.

Common names

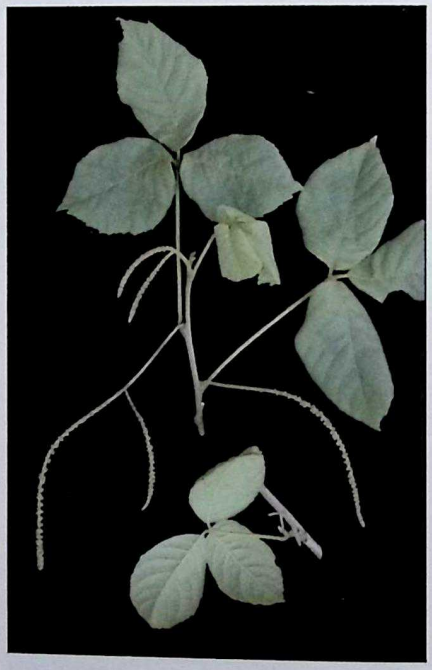
Bengali: rakhalphul; ***Kannada***: eruala, sidisale, togaratti; ***Malayalam***: mukkanamperu; ***Marathi***: tipani; ***Oriya***: khondokoli; ***Sanskrit***: triputah; ***Tamil***: amalai, naimaram; ***Telegu***: eravalu, tangutam, tantisa.

Description

A large shrub or small tree, up to 6 m tall, with dark grey or purple, scaly, fibrous bark and ferruginous tomentose branches. Leaves 7.5–15 cm long and 4.5–7 cm wide, digitately trifoliate; leaflets variable, ovate to lanceolate, elliptic or obovate-rhomboid, glabrous or with tufts of hair. Flowers white or yellowish-white, crowded on slender tassel-like racemes. Fruits (berries) globose, 6 mm in diameter, smooth, usually paired, red when ripe, 1-seeded.

Distribution and habitat

Found in peninsular India from west-central Maharashtra to Kerala, and in



Karnataka, Tamilnadu, Andra Pradesh, Orissa and from West Bengal to Nagaland, to approximately 1000 m elevation.

Medicinal properties and uses

The crushed leaves are eaten to induce lactation, and inhaled as a sternutatory to relieve headache, colds and rheumatic pains. The leaf-juice is vulnerary; a decoction of the leaves is given to treat colic, or

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as a drink for infants and children to reduce fever. The edible berries are used against tapeworm. The bark and leaves are reported to be a remedy for elephantiasis. The roots contain tannins and are considered astringent; they are reportedly used to treat piles and nosebleeds. A hot infusion of the root bark is used to check diarrhoea and rheumatic pains.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956), CSIR (1948–1992), Yoganarasimhan (1996).

Cardiospermum halicacabum L.

Botanical synonym

Cardiospermum microcarpum Kunth.

Common names

Bengali: lataphatkari, nayaphatki, sibjhul; ***English***: balloon vine, blister creeper, heart pea, heartseed, winter cherry; ***Gujarati***: kagdoliyo, karolio; ***Hindi***: kanphuti; ***Kannada***: agniballe, bekkina budde gida, kakaralata; ***Malayalam***: jyotishmati, katabhi, paluruvan, ulinna, uzhinja; ***Marathi***: kanphuti, kapala-phodi; ***Sanskrit***: indravalli, jyotishmati, jyotismati, karavi; ***Tamil***: moedakottan, mudukottan, samuttiram; ***Telegu***: buddakaakaraeega, buddakakara, tapaakaayateega.

Description

An annual or sometimes perennial climber, up to 3.5 m tall. Leaves alternate, deltoid, biternate, 3–8 cm long, petioles 2–3.8 cm long; leaflets deeply dentate or lobed, acuminate, lateral leaflets oblong or ovate, terminal leaflets rhomboid-lanceolate. Flowers white, 3–4 mm long, in few-flowered umbellate cymes, with a pair of peduncles modified into tendrils. Fruits (capsules) depressed-pyriform, 3-valved, covered with bladder-like calyx, winged at the angles; seeds globose, black, smooth, 4–6 mm in diameter, with a small, white, heart-shaped aril. In central India, flowers between August and November and fruits between October and January.

Distribution and habitat

Pantropical in distribution, it is commonly found as a weed throughout India up to 1200 m elevation.

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Medicinal properties and uses

The entire plant is used in Ayurvedic medicine; it is considered useful for promoting hair growth, and for treating rheumatism, nervous disorders, piles, chronic bronchitis, fevers, hydrocele, amenorrhoea, sprains and oedema. The roots and leaves are diuretic, laxative, stomachic, rubifacient and alterative. Among the tribal inhabitants of western Maharashtra, the whole plant is crushed in milk and applied to relieve swellings. The Rabari inhabitants of the Barda Hills in Gujarat use the whole plant, crushed in groundnut oil, as an external application to relieve fever, jaundice and swellings. The juice of the plant is used to treat earaches and to reduce hardened tumours. The herb is used in hair-oil preparations for curing dandruff, alopecia (hair loss), and for darkening hair; the aqueous extract is used as a cooling hairwash. Extracts from the plant have shown sedative effects on the central nervous system, as well as significant analgesic, anti-inflammatory, vasodepressant and antispasmodic activities. The leaves are emetic and stimulant and in powdered form are used externally for healing wounds. Their decoction is given in the treatment of piles, and an infusion for general sores. The pungent vapour from the crushed leaves is inhaled to relieve headache, and the juice is taken internally to reduce obesity. The fresh leaf-juice is sometimes given to asthma patients; among the rural inhabitants of Bhavnagar District in Gujarat, it is used to treat earache. A decoction of the leaf, with *jaggery* (molasses) and pepper is used to treat fever associated with cough. The leaf ash, mixed with coconut oil, is applied to relieve boils among the Kolams of Andhra Pradesh. The root is mucilaginous and considered diuretic, diaphoretic, emetic, emmenagogue, laxative and useful for treating asthma, colic, rheumatism, and the early stages of hydrocele. The juice from the pounded roots is taken orally for treatment of diarrhoea and dysentery among the Kolams of Andhra Pradesh. The aerial roots are used to induce abortion. A decoction of the roots is useful in treating amennorhoea, gonorrhoea, nervous diseases, haemorrhoids and erysipelas.

References

Asolkar *et al.* (1992), Bhatt *et al.* (1999), Chopra *et al.* (1956), CSIR (1948–1992), Jadeja (1999), Kirtikar *et al.* (1935), Sivarajan and Balachandran (1994), Ravisankar and Henry (1992), Upadhye *et al.* (1994), Yoganarasimhan (1996).

Dodonea viscosa (L.) Jacq.

Common names

Hindi: aliar, sanatha, sinatha, sonalta, walaytinahndi; ***Kannada***: bandara, bandarike, bhandaru; ***Malayalam***: unnataruvi, virali, vralli; ***Marathi***: bandari, bandurgi, lahan lokhandi, zakhmi; ***Oriya***: mohra; ***Punjabi***: banmendu, mendar, mendru, sanatta, santha; ***Sanskrit***: aliar, sanatta; ***Tamil***: valari, velari, virali; ***Telegu***: bandaru, bandedu, bhandaru.

Description

A variable evergreen shrub or a small tree up to 3 m tall with light green foliage, the young shoots and leaves sticky with a bright yellow resin. Leaves subsessile, simple, alternate, oblanceolate, 3.8–10 cm long and 0.6–3.8 cm wide, apex subacute or shortly apiculate, glabrous, shining, tapering towards the base. Flowers greenish-yellow, small, borne in few-flowered axillary cymes. Fruit a membranous, compressed, capsule 1.2–2 cm long and slightly broader, with a wide, marginal wing notched at the base and apex, viscid, orange-brown; seeds black. In central India flowering and fruiting occur mainly between October and March.

Distribution and habitat

Cosmopolitan, occurring naturally throughout most of India; it is commonly culti-

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vated as an ornamental shrub and for rehabilitating degraded sites. Gregarious in the Western Himalayas to an elevation of *c.* 2000 m in the understorey of *Pinus roxburghii* forests, and in dry forests in peninsular India, especially on sandstone-derived soils, to *c.* 2500 m. Natural regeneration is generally profuse.

Medicinal properties and uses

The powdered leaves are used to promote healing of wounds, swellings and burns. The leaves are also used as a febrifuge and sudorific in treating gout and rheumatism. An embrocation of the leaves is applied to sprains and bruises; in northeastern Karnataka a paste of the leaves is used externally to promote healing of bone fractures. Among the tribal inhabitants of Prakasam District in southern Andhra Pradesh, the leaf paste is used in the form of a plaster to heal wounds; the dried seeds pounded with black pepper are used to induce sterility in women. The bark is used in astringent baths and fomentations. In Siddha, the bark and leaf are used to treat inflammatory conditions.

References

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Sapindus laurifolius Vahl.

Botanical synonyms

Sapindus trifoliata L., *S. trifoliatus* auct. non L.

Common names

Bengali: bara-ritha, ritha; ***English***: soapnut tree of South India; ***Gujarati***: aritha, arithan; ***Hindi***: ritha; ***Kannada***: antarale, antavala, antuvala, kugatemara (tree), kunkatekaye (fruit); ***Malayalam***: arishtam, pasakotta, ponnan-kotta, urvanjikaya (fruit); ***Marathi***: ardal, pitha, ringin, rithe; ***Oriya***: muktamaya, muktimonjro, rettia; ***Punjabi***: reetha; ***Sanskrit***: aristakah, phenilah; ***Tamil***: ponnangottai, puvamkottai; ***Telegu***: homie, kunkudu-chettu (tree), kunkudu-kayalu (fruits), kunkullu, phenilamu; ***Urdu***: ritha.

Description

A small to medium-sized deciduous tree up to 18 m tall, with grey, shining bark covered with rough, deciduous scales. Leaves abruptly pinnate, 12–30 cm long; leaflets subopposite, usually 2–3 pairs, terminal pair the largest; leaflets lanceolate or elliptic-lanceolate, 8–22 cm long and 2.5–10 cm wide, apex acute or acuminate, margins entire, rounded at base; main nerves 8–12 pairs, petiolules 3 mm long, pubescent. Flowers white, polygamous, in terminal rusty-pubescent panicles; sepals 5, rotund-ovate, pubescent outside; petals 4–5, shortly clawed, narrower than the sepals, lanceolate. Fruits (schizocarps) fleshy, 2–3 cm in diameter, composed of 2–3 indehiscent cocci, densely villous when young, glabrous with age; seeds pea-

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sized, very hard, smooth, blackish. Flowering occurs from October to December in central India; fruits ripen between February and April.

Distribution and habitat

Native to south India and Sri Lanka, where it is common in deciduous and semi-evergreen forests of the Western Ghats at lower elevations. Occasionally cultivated as an avenue tree and around villages in West Bengal, Bihar, Madhya Pradesh and Uttar Pradesh.

Medicinal properties and uses

Fruits possess emetic, tonic, astringent and anthelmintic properties and are used in the treatment of asthma, colic due to indigestion, diarrhoea, cholera, tubercular glands, paralysis of the limbs and lumbago. A thick, watery solution of the pulpy mesocarp is taken nasally for relief of hemicrania and to restore consciousness during epileptic and hysteric fits. Roots and bark are used as a mild expectorant and demulcent. A vaginal suppository made from the seed kernels is used to stimulate the uterus during childbirth. In Ayurveda, the fruits form the drug *Aristhaka*, used to treat leprosy, pruritis, boils, diseases of the head, and also used as an emetic and abortifacient. In Siddha, the drug *Manipungu*, composed of the root and leaf, is used to treat fainting, inflammations, arthritis, intercostal neuralgia, amenorrhoea, epilepsy and snake-bite poisoning. The fruits are used externally as a detergent, and both the fruit and root bark are used as a fish poison.

References

Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

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Schleichera oleosa (Lour.) Oken.

Botanical synonyms

Pistacia oleosa Lour., *Schleichera trijuga* Willd.

Common names

Bengali: kusum, kosano; ***English***: Ceylon oak, lac tree, macassar oil tree; ***Gujarati***: kusum, kusumb; ***Hindi***: gausam, kosum, kusum; ***Kannada***: chakota, jendala chakota, kendaale, kendala, sagade; ***Konkani***: kassimb, kossombo; ***Malayalam***: puvam; ***Marathi***: kohan, koon, kusumb, peduman; ***Oriya***: kusamo, kussam, kusumo, rusam, swad; ***Punjabi***: gausam, jamoa, kussumb, summa; ***Sanskrit***: kosamra; ***Tamil***: karanchi, kolama, kula, pulachi, pumarantha, puvan, puvathipuvam; ***Telegu***: botanga, busi, kodali-pulusu, madaka-pulusu, mavita-vitiki, palusuramarajati, posuku, puska, sagade-pusuku.

Description

A medium-sized deciduous or nearly evergreen tree up to 18 m tall with a dense, spreading crown and short stem, the base often irregularly fluted. Bark pale brown, corky outside, exfoliating in irregular woody scales, pinkish inside, stippled with paler orange tissue. Leaves paripinnate, 20–40 cm long; leaflets 2–4 pairs, the lowest pair usually about one-third the size of the terminal, 5–25 cm long and 3–10 cm wide, elliptic or elliptic-oblong, coriaceous, margins entire, apex usually rounded. Flowers minute, yellowish-green, either male or bisexual, fascicled in spike-like axillary racemes 7.5–12.5 cm long. Fruits (berries) smooth or slightly prickly, globose or ovoid, hard-skinned, 1.3–3.8 cm long and 1.1–1.8 cm in diameter, 1–2-seeded; seeds brown, irregularly ellipsoidal, slightly compressed, 1–1.5 cm long, oily, enclosed in a succulent aril which dries up on the seed. In central India, flowering occurs mainly in March and April and fruiting between June and August; new foliage often deep red in colour.

Distribution and habitat

Native to dry deciduous forests of the sub-Himalayan tract from Pakistan to Nepal, and from southern Bihar through peninsular India to an altitude of 900 m, especially in moist localities; also found throughout Myanmar (Burma) and in Sri Lanka. It is

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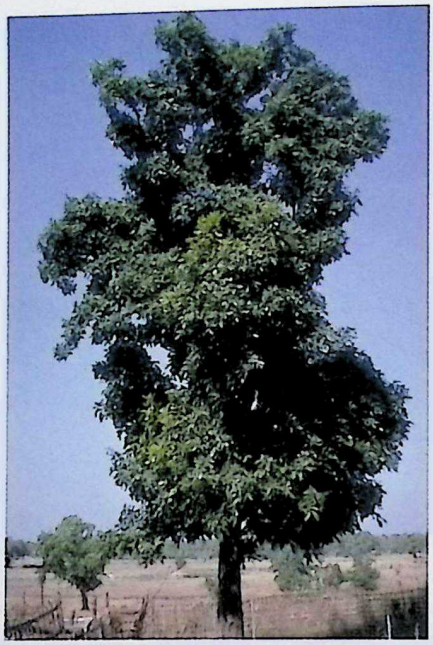
typical of mixed deciduous forests, often of the somewhat dry type. In central India, it occurs scattered in mixed forests, most commonly near streambanks, and prefers light, well-drained, gravelly or loamy, somewhat acid soils. Often grown for the cultivation of *lac*, for oil, and as an ornamental.



Medicinal properties and uses

The bark is astringent; rubbed with oil, it is used to relieve itching, back pain, inflammations and ulcers. An infusion or maceration of the bark is prescribed for treatment of malaria. In Ayurveda, the bark and yellowish-brown seed oil are used to treat ulcers, leprosy and other skin diseases. The seed oil is also used externally to treat acne and rheumatism, and to relieve body-ache and burns. It is also an efficient and stimulating agent for the scalp, both for cleansing and promoting hair growth.

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Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kumar and Jain (1998), Yoganarasimhan (1996).

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Sapotaceae

Madhuca indica (Koenig) Gmelin

Botanical synonyms

Bassia latifolia Roxb., *Madhuca latifolia* (Roxb.) Macbride, *M. longifolia* var. *latifolia* (Roxb.) Chev.

Common names

Bengali: banmahuva, mahula, mahwa, maul; ***English***: butter tree, mahua tree; ***Gujarati***: mahuda, mahura; ***Hindi***: madhua, mahua, mauwa, mohua, mohwa; ***Kannada***: doddippe, hallippa, hippe mara, ippi, kadippe; ***Konkani***: mohwa; ***Malayalam***: irippa, irippapu, kattirippa, puvuna; ***Marathi***: mahwa, moh, moho, mohwa; ***Oriya***: madgi, mahula, moha, moholo, mohuka; ***Sanskrit***: madhuka, madhukah; ***Tamil***: illuppai, kattiluppai, madugam; ***Telegu***: adaviyippa, ippa, madhukamu, peddayippa; ***Urdu***: mahuva.

Description

A medium-sized to large deciduous tree, usually 12–15 m tall, with a short trunk and large rounded crown; bark dark brown or black, cracked; inner bark dark red, milky. Leaves clustered near the ends of stout branches, broadly elliptic, coriaceous, crimson and pubescent when young, almost glabrous when mature, 5–25 cm long and 3.5–12 cm wide, apex shortly acuminate, base rounded to cuneate; main nerves 9–14 pairs, prominent beneath; petioles 2–4 cm long; stipules 0.6–1 cm long, subulate, densely pubescent. Flowers numerous, scented, clustered on leafless shoots; pedicels 2.5–4 cm long, densely rusty-pubescent; calyx 1.6 cm long, sepals elliptic, ovate-lanceolate or obovate, 9–10 mm long and 8–10 mm wide, acute, both inner and outer rusty-pubescent; corolla creamy-white, *c.* 1.3 cm long, tube 8 mm long, lobes narrowly obovate-oblong, 5–6 mm long and 2–3.5 mm wide, rounded, densely hairy below. Fruits (berries) ovoid or subglobose,

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2.5–5 cm long, greenish turning reddish-yellow or orange when ripe, fleshy; seeds 1–4, brown or ochre, oblong-ellipsoid, shiny, 2.5–3.8 cm long and *c.* 1.5 cm wide. Flowers appear with new leaves from February to April and fruits ripen from May to August in northern and central India. The closely related species *Madhuca longifolia* (L.) Macbride, restricted to southern India and Sri Lanka, is distinguished from *M. indica* by its evergreen habit, its flowers, borne on leafy shoots, and its leaves, which are narrower (0.8–4 cm wide).

Distribution and habitat

Native to India, Sri Lanka and perhaps Myanmar (Burma). Found in mixed, more typically dry, deciduous forests throughout most of India to an altitude of 1200 m. Common thoughout central India on rocky and sandy soils. Extensively planted in the plains of northern and peninsular India.

Medicinal properties and uses

The seed oil has emollient properties and is useful for external application in treating skin diseases, rheumatism and headache. It is also laxative and used to treat chronic constipation, piles and haemorrhoids, and is sometimes used as an emetic and galactagogue. Known commercially as *mahua* oil, it is also used for the manufacture of laundry soaps. Mahua flowers (corollas) are highly nutritious and are eaten raw or cooked and used for making distilled spirits and vinegar. They are considered cooling, tonic and demulcent and prescribed in the form of a decoction for coughs, colds and bronchitis as well as impotence due to general debility when administered with milk. Their decoction is also used as an expectorant. A fomentation of the fresh and dried flowers is used as a sedative in the treatment of orchitis. Among the Baigas of northeastern Madhya Pradesh, the dried, ground flowers are applied as a paste to

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relieve aching muscles. A pickle prepared from the flowers is given as a supplemental treatment in tuberculosis among the tribal inhabitants of eastern Bihar. The bark is used for treating rheumatism, ulcers, itches, bleeding and spongy gums, tonsilitis and diabetes mellitus. In the form of a decoction the bark is used as an astringent, emollient, hypoglycaemic and tonic; it is used by the tribal inhabitants of Sundargarh District in Orissa as a remedy for pyorrhoea. The roots are applied externally to promote healing of ulcers.

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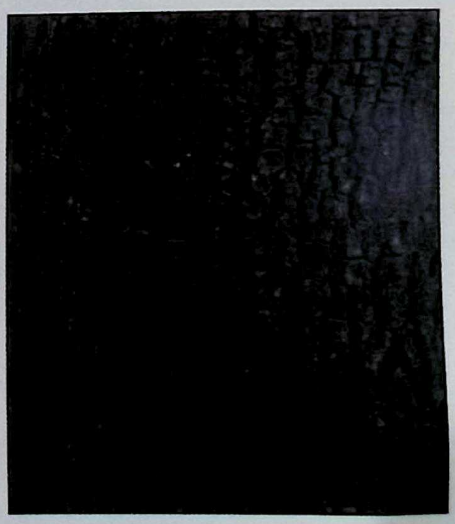
Mimusops elengi L.

Botanical synonyms

Mimusops elengi var. *parviflora* (R. Br.) H.J. Lam., *M. parviflora* R. Br.

Common names

Bengali: bakul, bohl, bukal; ***English***: Asian bulletwood, Spanish cherry; ***Gujarati***: barsoli, bolsari; ***Hindi***: bakul, bhonsari, malsari, maulsari, mulsari; ***Kannada***: bakula, pagade, pagadi mara; ***Konkani***: vonvol, vouvoly; ***Malayalam***: bakulam, enengi, ilanni; ***Marathi***: bakhor, bakula, barsoli, ovalli; ***Oriya***: bokulo baula, boulo, kirakuli; ***Punjabi***: maulsari; ***Sanskrit***: bakula, bakulah, vakula; ***Tamil***: inalji, magadam, magilam, mahila, vagulam; ***Telegu***: pogada, pogadachettu, vakulamu; ***Urdu***: molsari.



Description

An evergreen tree, usually 12–15 m tall, with a dense rounded crown, short trunk; bark brown, cracked or fissured, inner bark red or reddish-brown, latex white. Leaves alternate, elliptic-oblong, 6.3–10 cm long and 3.2–5 cm wide, apex acuminate, base acute or rounded, coriaceous, shiny, glabrous, with undulate margins; petioles 1.3–2.5 cm long. Flowers small, creamy-white, star-shaped, fragrant, nearly 2.5 cm across, solitary or in 2–6-flowered axillary fascicles; buds ovoid, acute; pedicels 0.6–2 cm long; calyx 1 cm long, fulvous-pubescent, sepals ovate, tomentose; corolla longer than the calyx, lobes 8 mm long, about 24, linear-oblong, acute. Fruits

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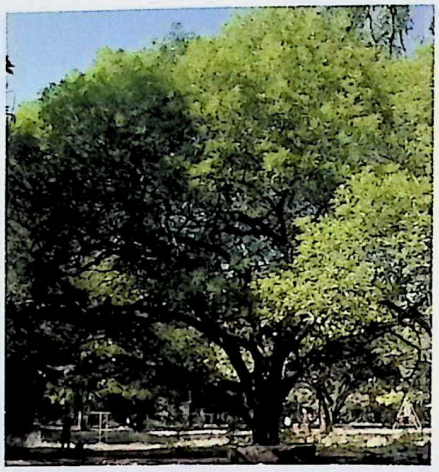
(berries) ellipsoid, 2.5–2.5 cm long, 1-seeded berries, yellow to orange-red when ripe; seed brown, ellipsoid, compressed, shining. In peninsular India flowering and fruiting occur between March and January.



Distribution and habitat

Probably native to India, Sri Lanka, Myanmar (Burma), Indochina, Thailand and the Andaman Islands; frequently cultivated in gardens and parks for ornament and as an avenue or shade tree throughout tropical India and elsewhere in the tropics. Under natural conditions in peninsular India, it is found in semi-evergreen and deciduous forests from the coastal plains to an altitude of about 900 m in the Western and Eastern Ghats. Its best growth occurs in the moist evergreen forests of the Western Ghats and in the Andamans.

Medicinal properties and uses

The astringent pulp of the ripe fruits is used to treat chronic dysentery. The seeds are purgative; made into a paste with oil or *ghee* (clarified butter), they are used in suppositories to relieve chronic constipation, particularly in children. A snuff made from the dried flowers induces copious defluxion from the nose and relieves headache and pains. Both the flowers and fruits are used with other astringents to prepare a lotion for treating wounds and ulcers. The bark is astringent, febrifuge and tonic; it is believed to increase fertility in women. Its decoction, or expressed juice, is used as a gargle for treating gum and tooth diseases; the tribal inhabitants of Orissa use it as remedy for diarrhoea.

References

Chatterjee and Pakrashi (1995), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935), Mukherjee and Namhata (1990), Rao *et al.* (1996).

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Scrophulariaceae

Alectra parasitica A. Rich. var. *chitrakutensis* M.A. Rau

Common names

Hindi: nirgundi, nirgundikanda; ***Sanskrit***: bhramarari, bhrngari.

Description

An annual parasitic herb, distinguished from the African species *Alectra parasitica* by its more marked rhizome development. Rhizomes fleshy, bright deep yellow when fresh, turning blackish-yellow or black on drying. Leaves scale-like, 1.2 cm long and 2–5 mm wide, linear-oblong, obtuse, hispid. Flowers yellow with purple streaks in the petals, borne in racemes on an angular, 5–20-cm-long, purplish flowering axis; calyx campanulate, hairy outside, glabrous within, lobes shorter than the tube, acute; bracts linear, as long as or longer than the flowers. Fruits (capsules) globose, 0.5 cm in diameter, dehiscing into 4 valves; seeds minute, cuneiform.

Distribution and habitat

Found in dry deciduous forest regions in northern Maharashtra, Madhya Pradesh, southern Uttar Pradesh (Banda District) and parts of Rajasthan.

Medicinal properties and uses

The fresh rhizomes, taken internally, are used in traditional Indian medicine for treatment of leprosy, tuberculosis, paralysis, oedema, fevers, intestinal worms and constipation. In Ayurvedic medicine, they are used to treat skin diseases.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956), CSIR (1948–1992).

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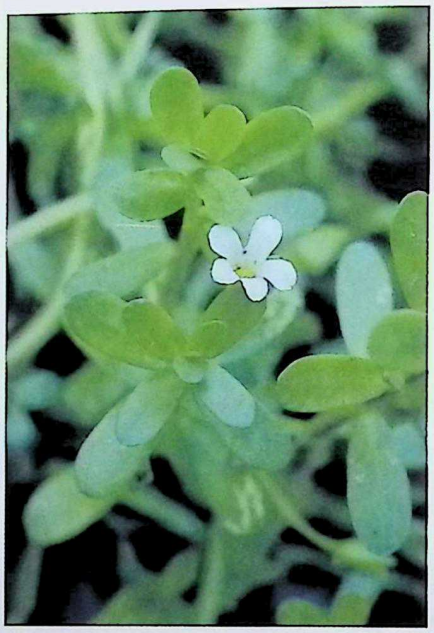
Bacopa monnieri (L.) Pennell



Botanical synonyms

Bacopa monnieria (L.) Wettst., *Gratiola monnieria* L., *Herpestis monniera* Benth., *H. monnieria* (L.) HBK., *Lysimachia monnieri* L., *Moniera cuneifolia* Michx.

Common names

Bengali: adhabirni, brahmisak, dhopchamni, jalanimba; ***English***: bacopa, thyme-leaved gratiola; ***Gujarati***: kadaviluni; ***Hindi***: barambhi, brahmi, safedchanmi; ***Kannada***: neer brahmi, nirubrahmi; ***Malayalam***: brahmi, nirbrahmi, nirubrahmi; ***Marathi***: neerbrahmi; ***Sanskrit***: brahmi, nira-brahmi; ***Tamil***: brami, nirbrahmi, nirpirimi; ***Telegu***: sambranichettu; ***Urdu***: jalanim, nirabrahmi.

Description

A creeping, diffusely branched, somewhat succulent herb; stems obtuse-angular, 10–30 cm long, rooting at the nodes; branches numerous, ascending. Leaves sessile or short-petioled, obovate-oblong or decussate, 0.6–2.5 cm long and 0.2–1 cm wide, rather fleshy, dotted with black specks. Flowers white to pale blue or violet, solitary, borne in leaf axils on slender pedicels 0.6–3.2 cm long; calyx glabrous, divided to the base, sepals *c.* 6 mm long, ovate or lanceolate, acute; corolla 8 mm long, tube broadly campanulate, lobes nearly equal, rounded, with shining dots when fresh. Fruits (capsules) 5 mm long, ovoid, acute, included in the persistent calyx; seeds *c.* 0.85 mm long, oblong, striate, pale. Flowers and fruits throughout the year.

Distribution and habitat

Common in wet or marshy habitats and along stream and river margins throughout India to approximately 1300 m elevation.

Medicinal properties and uses

The whole plant is the source of the Ayurvedic drug *Brahmi*, an important ingredient of several Ayurvedic preparations such as *Brahmighritam* (used to treat epilepsy and hysteria), *Brahmirasayanam*, *Sarasvataristam*, *Brahmitailam* and *Misrakasneham*. It is considered astringent, diuretic, laxative and a tonic for the heart and nerves, and is used in Ayurveda to improve memory and intelligence, and to treat dermatosis, anaemia, diabetes, cough, dropsy, fever, arthritis, anorexia, dyspepsia, emaciation and insanity. In other traditional Indian systems of medicine it is used to treat asthma, hoarseness, anxiety neurosis, insanity, epilepsy, cough, dropsy, fever, anorexia, dyspepsia and emaciation, and as a potent nerve tonic, cardiotonic and diuretic. The juice of the leaves is used in the treatment of bronchitis and diarrhoea in children; a paste of the leaves is applied to treat arthritis. Among the tribal inhabitants of Maharashtra, 5 leaves eaten daily for 1 month are believed to improve the speech of stutterers. The boiled leaves are applied to the abdomen to relieve postnatal pains by Bhil women in Rajasthan. The warmed leaves are also used by the Bhils as a poultice to relieve swellings following beatings.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Jadeja (1999), Joshi (1989), Kirtikar *et al.* (1935), Sivarajan and Balachandran (1994), Upadhye *et al.* (1994), Yoganarasimhan (1996).

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Lindernia crustacea (L.) F. Muell.

Botanical synonyms

Capraria crustacea L., *Vandellia crustacea* (L.) Benth.

Common names

None reported.

Description

An erect or prostrate, glabrous, diffusely branched, annual herb up 30 cm tall, rooting at the lower nodes. Leaves ovate, 0.5–2 cm long and 0.4–1.5 cm wide, apex acute or obtuse, base rounded or subcordate, margins entire to crenate-serrulate; petioles 2–8 mm long. Flowers axillary, solitary; pedicels slender, 0.5–2 cm long; calyx *c.* 0.35 cm long, glabrous or hairy, lobes acute; corolla blue-violet, 6 mm long, lower lip with a yellow spot at the base. Fruit (capsule) ellipsoid-oblong, apiculate with a persistent style, 3.5–5 mm long and 2–3 mm wide. Flowers and fruits between August and November.

Distribution and habitat

A palaeotropical species found thoughout India to an altitude of 1600 m in the Himalayas. Common in moist, open grassy habitats such as in agricultural fields, in gardens, on roadsides and in forest clearings.

Medicinal properties and uses

The plant reportedly contains a bitter principle and is used to treat bilious affections and dysentery in Southeast Asia. It is also used in poultices to relieve boils, sores, ringworm and itches.

References

Chopra *et al.* (1969), CSIR (1948–1992), Yoganarasimhan (1996).

Scoparia dulcis L.

Botanical synonym

Gratiola micrantha Nutt., *Scoparia grandiflora* Nash

Common names

English: sweet broomweed; ***Kannada***: mrugandhi gida; ***Oriya***: banaganjei.

Description

An erect, divaricately branched, fetid-smelling perennial herb up to 90 cm tall; stem 5–6-angled, glabrous. Leaves opposite or in whorls of 3, oblong-ovate to oblanceolate, 0.5–3.8 cm long and 0.8–1.5 cm wide, tapering at base, subacute at apex, margins entire or coarsely crenate-serrate, glabrous on both surfaces; petioles up to 0.9 cm long. Flowers small, borne in small, 2–6-flowered axillary whorls on slender pedicels 8–13 mm long; corolla white, 0.5 cm in diameter. Fruit (capsule) subglobose, 3–4 mm in diameter.

Distribution and habitat

Indigenous to tropical America and introduced to India during the 18th century.

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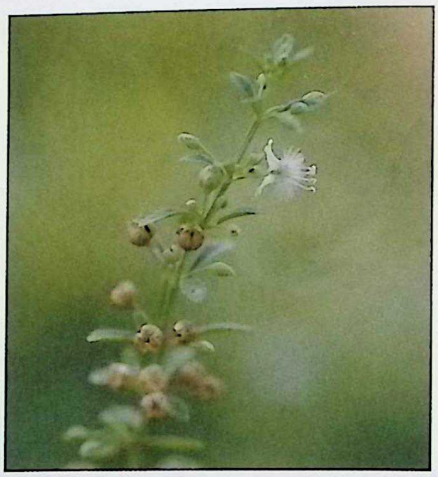
Very common in cultivated fields and roadsides in lowland areas in many parts of the country, particularly in West Bengal and Tamilnadu, to an elevation of about 900 m in southern India.



Medicinal properties and uses

An infusion of the leaves is used to treat fever, cough and bronchitis, and as a gargle for toothache. A hot infusion acts as a diuretic and a cold decoction of the plant is used to relieve gravel and kidney complaints. An infusion of the roots, leaves and flowering tops is considered useful for treating diarrhoea and dysentery. A decoction of the leaves and roots is used to relieve fevers. All parts of the plant are used as an emetic. The aqueous extract obtained from the crushed aerial parts of the plant is taken orally in the treatment of spermatorrhoea among the tribal inhabitants of central Orissa. In eastern Bihar, the leaf juice is taken with yoghurt for treating jaundice; tribal women in this region also use the juice of the plant to test for pregnancy: when mixed with urine, a colour change is considered a positive indicator. The fresh leaves and stems contain an antidiabetic compound (*amellin*) that reportedly relieves symptoms of glycosuria, reduces hyperglycaemia, increases red blood cell count, and is useful for relieving various complications associated with diabetes mellitus; amellin reportedly reduces both blood and urine sugar level more gradually than insulin does.

References

Chopra *et al.* (1956, 1969), CSIR (1948–1992), Jha and Varma (1996), Kirtikar *et al.* (1935), Sahoo and Mudgal (1995), Yoganarasimhan (1996).

Sopubia delphinifolia (L.) G. Don

Botanical synonym

Gerardia delphinifolia L.

Common names

Gujarati: dudhali; ***Marathi***: dudhali.

Description

An annual, much branched, hemiparasitic herb up to 1 m tall; stems dark purple towards base, 4-grooved. Lower leaves 2–5.7 cm long, pinnatisect with unequal, filiform, segments; upper leaves opposite, linear-filiform, 1.5–2.2 cm long, margins entire. Flowers white or purple, solitary, axillary below or in racemes above. Fruits (capsules)

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numerous, oblong-ellipsoid, 5.5–6.6 mm long and 3 mm wide, black, glabrous.

Distribution and habitat

Common in open habitats such as cultivated fields from the Indo-Gangetic plains southward through the Indian peninsula and Sri Lanka. In southern India it is common in rocky forest habitats in forests, fields and grassy slopes to an elevation of about 2100 m on the eastern slopes of the Western Ghats; less common on the west coast. Occasionally grown as an ornamental plant.

Medicinal properties and uses

The juice of the herb is astringent and is applied to heal sores on the feet caused by exposure to moisture.

References

Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

Striga gesnerioides (Willd.) Vatke ex Engler

Botanical synonyms

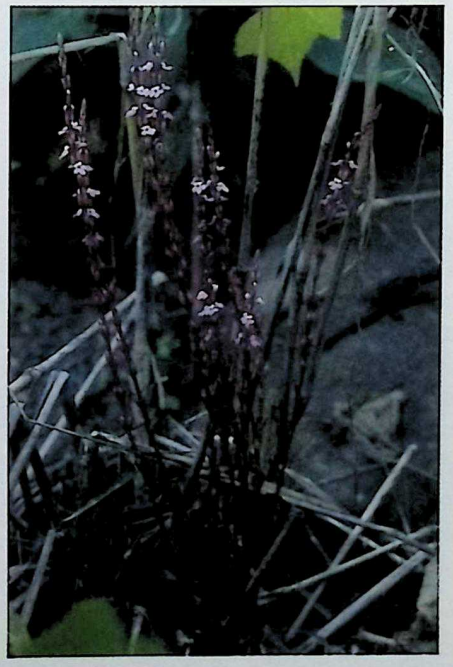
Buchnera gesnerioides Willd., *Striga orobanchoides* (R. Br. ex Endl.) Benth.

Common names

Gujarati: ratoagio; ***Hindi***: lalagia; ***Marathi***: tambadikarichavgat.

Description

A small, erect herb 15–30 cm tall, usually parasitic on the roots of various forest plants, or sometimes growing on rocks. Stems numerous, arising from a tuberous rootstock, simple or branched, dark reddish-purple. Leaves scale-like, ovate-oblong, apex acute, dark reddish-purple like the stems. Flowers numerous, sessile, erect, whorled in densely flowered, erect, terminal spikes 15–20 cm long; floral bracts ovate, acute, pale green, 7 mm long and 2.5 mm wide; calyx *c.* 0.7 cm long, 4- or 5-ribbed, teeth 4–5, narrowly lanceolate, very acute, bristle-tipped; corolla 2-lipped, white or pale pink with a white spot at the base of each lobe, tube up to 1.3 cm long, incurved, throat hairy, lobes obovate-oblong, rounded. Capsule ovoid-globose, 5–7 mm long and 3 mm wide, glabrous, black, tipped with the base of the withered style; seeds numerous, oblong, 0.6 mm long, usually reticulate.



Distribution and habitat

Found in the western regions of peninsular India from Gujarat southwards. Also occurs in Sri Lanka, tropical and subtropical regions of Africa, and in the Middle East.

Medicinal properties and uses

The plant is reportedly used to treat diabetes, although experimental studies have thus far indicated no hypoglycaemic activity.

References

Chopra *et al.* (1956), CSIR (1948–1992), Yoganarasimhan (1996).

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Simarubaceae

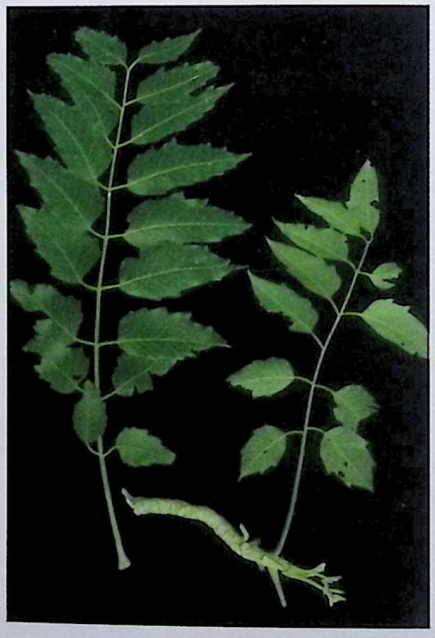
Ailanthus excelsa Roxb.

Botanical synonym

Pongelion wightii van Tiegh

Common names

English: tree of heaven; ***Gujarati***: adusa, arduri, motoaduso, moto-araduso; ***Hindi***: limbada, maharuk, maharukha; ***Kannada***: bende, doddabevu, doddamara, hemaraheera mara; ***Malayalam***: mattipongilyam, peru; ***Marathi***: adulsa, mahanimb, maharuk; ***Oriya***: gorimakkaba, mahala, mahanim, yoli; ***Sanskrit***: aralu, atarusha, madala, mahanimba; ***Tamil***: peruppi, peru, perumaruttu; ***Telegu***: peddaman, peddamanu.



Description

A large, deciduous tree, up to 24 m tall, with a straight, cylindrical bole; bark light grey and smooth in young trees, with large leaf-scars, or rough, granular and greyish-brown in older trees. Leaves pinnately compound, usually 20–30 cm long (occasionally to 90 cm); leaflets 6–14 pairs, alternate or subopposite, very variable in shape, 10–15 cm long, margins irregularly toothed, base unequal; petiolules 2–5 cm long. Flowers small, yellowish, borne in large, lax, branched panicles; calyx lobes ovate triangular; petals 4 mm long, ovate-lanceolate, glabrous, reflexed. Fruit a 1-seeded samara 3.8–5.5 cm long and 1–1.3 cm wide, lanceolate, acute at both ends, reddish-brown, twisted near the base, many-nerved. In central India, flowering occurs mainly between January and March and fruiting from April to May.

Distribution and habitat

Indigenous to central and southern India and found throughout Madhya Pradesh, southern Bihar, eastern Gujarat, coastal districts of Andhra Pradesh and parts of Orissa. Extensively cultivated in many

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parts of India in the vicinity of villages and as an avenue tree in cities. It grows best on porous loamy soils.

Medicinal properties and uses

The bark is aromatic, bitter, astringent, febrifuge and anthelmintic, and possesses antispasmodic and expectorant properties. In Ayurvedic and Unani practice, it is used to treat asthma and bronchitis, and as an astringent for diarrhoea and dysentery. It is also used to treat dyspepsia and earache. Among the Kolams of northern Andhra Pradesh, the fresh stem bark is chewed to relieve stomach pain. The bark has antiseptic properties and is used as an infusion to promote healing of wounds. In Rajasthan, the Bhils inhale the vapours of the boiling bark to treat coughs and colds. A tonic prepared from the bark and leaves is used in various parts of India to relieve debility following childbirth.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Joshi (1989), Kirtikar *et al.* (1935), Mohanty *et al.* (1996), Ragupathy and Mahadevan (1991), Ravisankar and Henry (1992).

Balanites aegyptiaca (L.) Delile

Botanical synonyms

Balanites roxburghii Planch., *Ximenia aegyptiaca* L.

Common names

Bengali: hingon; ***English***: desert date; ***Gujarati***: egorea, hinger, hingoriyun, ingoriyo; ***Hindi***: hingan, hingoli, hingota, hingu; ***Kannada***: ingalara, ingalarade, ingalore, ingalukke; ***Malayalam***: nanjunta; ***Marathi***: hingan, hingane, hingoli; ***Oriya***: ingudihala; ***Sanskrit***: angavriksha, ingudi; ***Tamil***: nanjunda, nanjundan, totuvattu; ***Telegu***: gara, gari, ingudi, ringri; ***Urdu***: hingot.

Description

A spiny shrub or small, evergreen tree, rarely up to 9 m tall; bark grey, young parts pubescent, tomentose or glabrescent; twigs armed with stout, axillary spines 1–6 cm long, often bearing leaves or flowers. Leaves alternate, 2-foliate; petioles 3–6 mm long; leaflets elliptic or obovate, 1–5 cm long, apex obtuse, subacute or broadly pointed, petiolules to 0.5 cm long. Flowers small, greenish-white, fragrant, borne in axillary, few- or many-flowered fascicles; sepals 5, ovate, 3 mm long, pubescent outside; petals 5, oblong-obovate, glabrous outside. Fruit an ovoid, woody drupe, 2.5–6 cm long on a short, thick stalk, faintly 5-grooved, pale

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yellow when ripe, enclosing a hard, fibrous seed embedded in an oily, offensive-smelling pulp. In central Indian forests, flowering occurs mainly in April and May, and fruits mature in November.

Distribution and habitat

Native to northeastern Africa and Arabia to the semi-arid and dry deciduous forest regions of the Indian subcontinent. Found throughout the drier parts of peninsular India southwards to Karnataka and Tamilnadu, in western Rajasthan, and from southeastern Punjab to West Bengal and Sikkim. This species is characteristic of black cotton soils in peninsular India; also common on open sandy plains.

Medicinal properties and uses

The seed kernel oil possesses antibacterial and antifungal properties, and is reportedly used in the treatment of skin diseases, burns and scrapes. The unripe fruits, seeds, leaves and bark are reported to possess anthelmintic and purgative properties. The fruit is considered useful for treating whooping cough and skin diseases. The fruit pulp, mixed with goat's milk, is rubbed on the chest to treat pneumonia in children. In northeastern Karnataka the powdered fruit, mixed with soapnut powder (from the fruits of *Sapindus laurifolia*: *Sapindaceae*), cardamom, ginger and clove, is used to treat jaundice; in this region the fruit extract is also considered useful for treating jaundice when applied to the eye. Among the rural inhabitants of Bhavnagar District in Gujarat, the fruit pulp is also used as an external application for boils and acne; among the Rabaris in the Barda Hills of Gujarat, it is given with curd (yoghurt) to treat diarrhoea. The seeds are reported to possess expectorant properties, and are used to relieve coughs and colic. The powdered seeds are

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used to ease childbirth. A decoction of the roots is reportedly emetic. An extract of the roots and leaves is used for washing inflamed parts of the body among the tribal inhabitants of Udaipur District in Rajasthan. The fruits and roots are reported to be a potential source of diosgenin used in oral contraceptives. The bark is used as an anthelmintic in cattle; its juice is used as a fish poison. The acidic fruit juice is used to remove stains on clothes, and for cleaning cotton and silk, and the fruit pulp is considered an excellent corrosion inhibitor for brass.

References

Asolkar *et al.* (1992), Bhatt and Mitaliya (1999), Bhatt *et al.* (1999), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Jadeja (1999), Katewa and Arora (1997), Kirtikar *et al.* (1935), Seetharam *et al.* (1999).

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Smilacaceae

Smilax wightii A. DC.

Botanical synonyms

Smilax macrophylla Roxb., *S. ovalifolia* Roxb., *S. zeylanica* L.

Common names

Bengali: kumarika; ***Hindi***: chobchini, jangli aushbah, ramdatun; ***Kannada***: kaadu hambu thaavare; ***Malayalam***: kaltamara, karivilanti; ***Marathi***: gholyel, ghotvel, guti, gutwel; ***Sanskrit***: vanamadhusnahi; ***Tamil***: kattu-kodi, malaittamarai, periyakanni; ***Telegu***: kondagurvatiga, kondatamara.

Description

A large climber with slender, smooth or sparsely spiny, striate, quadrangular branches. Leaves alternate, 8–20 cm long and 4–12 cm cm wide, variable in shape (ovate, elliptic or lanceolate), glabrous, shining, apex acuminate or cuspidate, base usually rounded; main nerves 5–7; petioles 1.3–2.5 cm long, stout, narrowly sheathing below the middle; tendrils very long and slender. Flowers greenish-white, borne on stalked, many-flowered umbels, 1–3 together; pedicels of both male and female flowers arising from an aggregation of numerous minute bracts, flower segments 6, usually reflexed. Fruit (capsule) spherical, pea-sized, smooth, green turning red when ripe.

Distribution and habitat

Found in hilly areas throughout tropical India from the Himalayas to Kerala to an altitude of about 2500 m; the species is also native to Java.

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Medicinal properties and uses

A decoction of the bulbous roots is used to promote healing of sores, swellings and abscesses. In some parts of India the roots are taken internally to treat skin diseases, and as a substitute for sarsaparilla for venereal diseases. In Ayurvedic practice, the roots are used to treat diseases of the nervous system and urinary disorders. Among the Santhalis, they are applied to relieve rheumatism and pains in the lower extremities. In Bastar (Madhya Pradesh) the roots are used to treat spermatorrhoea, to promote fertility and as a refrigerant.

References

Chopra *et al.* (1956), CSIR (1948–1992), Hemadri and Rao (1989), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

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Solanaceae

Datura metel L.

Botanical synonyms

Datura fastuosa L., *D. fastuosa* var. *alba* (Nees) C.B. Clarke

Common names

Bengali: dhatura, kaladhutura; ***English***: thorn-apple; ***Gujarati***: kaladhatura, kalodhatura, kalodhaturo; ***Hindi***: dhatura, kaladhatura, sadahdhatura; ***Kannada***: biliyummatta, dhattura, kariyummatta, maddugunike, ummatta, visha ummathi; ***Malayalam***: kariymmatta, karummattu, madanam, nilayummata, ummam, ummata; ***Marathi***: dhatura, kaladhotra; ***Oriya***: jambunoda, kaladudura, khorodushono; ***Sanskrit***: dhattura, dhatturah, dhastura, unmatta; ***Tamil***: karuvumattai, madumattai, ponnumattai, vellummattai; ***Telegu***: dutturamu, matulaputrakamu, nallavummetta, tellavummatta, ummetta.

Description

An erect, soft-stemmed shrub usually less than 1 m tall; branches somewhat zig-zag, almost glabrous, green or reddish-tinged to almost black. Leaves large, acrid-smelling when crushed, triangular-ovate in outline, irregularly toothed or lobed, 7.5–15 cm long and 3.2–7.5 cm wide, largest leaves usually towards the ends of shoots, apex acute or acuminate, base unequal; main nerves conspicuous, usually about 8 on one side of the midrib and 6 on the other side; petiole one-third to one-half as long as leaf blade. Flowers erect, solitary in leaf axils, tubular to funnel-shaped; calyx 6–8 cm long; corolla up to 18 cm long and 10–12.5 cm wide at the mouth, white to violet or purple on the outside and white within. Fruit a globose capsule, usually covered with stout tubercles or prickles, borne on a short, thick, drooping peduncle;

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capsule 4-valved or irregularly dehiscent near the apex, containing a mass of closely packed, yellowish-brown, flat seeds. Flowers and fruits throughout the year, but principally from July to December in most localities in peninsular India.

Distribution and habitat

Pantropical in distribution, it occurs naturally in open, disturbed habitats such as roadsides, along railway lines and wastelands throughout India; occasionally grown in gardens.

Medicinal properties and uses

The roots, dried leaves and flowering tops have long been used in India for their narcotic and antispasmotic properties in the treatment of numerous ailments and conditions; they are used in a number of important compound formulations such as *Kanakasavam*, *Dhurdhuradi tailam*, *Dhurdhurapatradi* coconut oil and *Mrtasanjivini*. In Ayurveda the plant is considered bitter, acrid, astringent, germicidal, anodyne, antiseptic, antiphlogistic, narcotic and sedative. The warmed leaves are used externally to expel guinea worms in Rajasthan. The young, fresh leaves are used internally in the treatment of amenorrhoea among tribal women in central Orissa. The juice of the fresh leaves, or a poultice of them, is used to relieve painful swellings and earache. Among the tribal inhabitants of Prakasam District in southern Andhra Pradesh, a paste of the leaves mixed with lime is used as an external application to treat scabies; pills made from the leaves, pounded with black pepper and garlic, are given orally to treat fever. In Ayurveda, the seeds are considered heating, tonic, febrifuge, anthelmintic, alexiteric and emetic; they are used to treat leucoderma, skin diseases, ulcers, bronchitis, jaundice and piles. In Rajasthan the seeds are reportedly used to treat leprosy. The seed and root possess antidiarrhoeal, antipyretic and antiseptic properties and are used to treat insanity and fever associated with catarrh. The root powder is reportedly given for 15 days after menstruation to induce sterility among Gond women in Uttar Pradesh.

References

Asolkar *et al.* (1992), Chatterjee and Pakrashi (1995), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Jain *et al.* (1989), Sahoo and Mudgal (1995), Singh and Prakash (1994), Sivarajan and Balachandran (1994), Vijaya Kumar and Pullaiah (1998), Yoganarasimhan (1996).

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Hyoscyamus niger L.

Common names

Bengali: khorasaniajowan; ***English***: black henbane, hyoscymus, symphonica; ***Gujarati***: khorasaniajmo, khorasaniajvan; ***Hindi***: khurasaniajvayan, khurasanijamani, khurosaniyamani; ***Kannada***: khurasanivadakki, khurasanivoma; ***Marathi***: khorasanivova; ***Punjabi***: bangidewana, bazrbang, datura, sura; ***Sanskrit***: dipya, khurasaniajvayan, parasikayavani, yavani; ***Tamil***: kurasaniyomam; ***Telegu***: khurashanivamam, kurinjivamam; ***Urdu***: khoranasiyajwan.

Description

An erect, more or less hairy and viscid, annual or biennial herb with a disagreeable, fetid smell; stem robust, 0.3–0.9 m tall. Radical leaves spreading, stalked, oblong-ovate, 15–20 cm long, margins coarsely sinuate-toothed; stem (cauline) leaves smaller, sessile, ovate, irregularly pinnatifid. Flowers yellowish-brown or pale green with purplish veins, funnel-shaped, sessile or subsessile, borne in terminal cymes. Fruit (capsule) 1.3 cm in diameter, enclosed in the globose tube of the enlarged calyx; seeds numerous, minute, oval or kidney-shaped, about 1.5 mm long, brown, marked with fine but conspicuous reticulations. Flowers and fruits during the summer months.

Distribution and habitat

Occurs naturally in Europe and in western and northern Asia southwards to the temperate western Himalayas from Kashmir to Kumaon at altitudes between 2700 and 3700 m. Occasionally cultivated in other parts of the country for its medicinal uses.

Medicinal properties and uses

The dried leaves and flowering tops constitute the drug *henbane*, valued mainly for its alkaloid content, principally hyoscyamine and hyoscine. The leaves possess anodyne, sedative, narcotic and mydriatic properties and are used as a sedative in nervous affections and irritable conditions such as asthma and whooping cough. It acts as a milder deliriant than belladonna (from deadly nightshade: *Atropa belladonna*: *Solanaceae*) but is more hypnotic and quicker-acting. It is also used to counteract the griping action of purgatives and to relieve spasms in the urinary tract. Poultices, plasters and medicated oils prepared from the leaves and seeds are used to relieve inflammatory swellings. The seeds also possess anodyne and narcotic properties although they are rarely used in medicine due to their toxicity in large doses. However, the powdered seeds and smoke from burning seeds are reportedly applied to relieve toothache, and a suppository prepared from seeds is used to relieve painful affections of the uterus.

Warning

All parts of the plant contain alkaloids that are poisonous in large doses; overdoses can result in delirium, coma and death.

References

Asolkar *et al.* (1992), Chatterjee and Pakrashi (1995), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

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Lycopersicon esculentum Mill.

Botanical synonyms

Lycopersicon lycopersicon (L.) Britton & Brown, *L. lycopersicum* (L.) Farwell

Common names

Bengali: baingan, bilatibegun, tamatar, vilayithi baingan; ***English***: tomato; ***Gujarati***: vilayithi vengan; ***Hindi***: baingan, tamatar, vilayithi baingan, vilaythibaigun; ***Kannada***: chapperbadnekai, chapperbhende; ***Konkani***: tambuta; ***Marathi***: bailwangi, vel vangi; ***Sanskrit***: raktamaci, raktavardhak, ramphala, shak-stmeshdha; ***Tamil***: takkali.

Description

A tall, spreading, unarmed, pubescent herb with a characteristic odour. Leaves unevenly pinnate; pinnae toothed or lyrate. Flowers yellow, borne in peduncled, few-flowered cymes. Fruits (berries) globose, red when ripe, pulpy, containing numerous compressed, papillose seeds. Four subspecies are recognized: subspp. *typicus*, *galeni*, *humboldtii* and *intermedium*; the cultivated varieties of tomato are derivatives of subsp. *typicus*. The size and shape of the fruits and thickness of the pericarp vary among the numerous cultivated types. Flowers and fruits in India mainly between November and February.

Distribution and habitat

Indigenous to western regions of tropical South America and cultivated on a commercial scale throughout India for the past century.

Medicinal properties and uses

The pulp and juice of the fruit are considered an intestinal antiseptic, a mild aperient, blood-purifier, cholagogue and digestive. It promotes gastric secretion, is a gentle renal stimulant and is useful for treating asthma, bronchitis, atonic dyspepsia and apthous stomatitis.

References

Chatterjee and Pakrashi (1995), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Yoganarasimhan (1996).

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Nicotiana tabacum L.

Common names

Bengali: tamak, tamaku, tambaku; ***English***: American tobacco, tobacco, Virginia tobacco; ***Gujarati***: tamaku, tambaku; ***Hindi***: bujjerbhang, tamaku, tambaku; ***Kannada***: hogesoppu; ***Konkani***: dhuinti, pan; ***Malayalam***: pokala, pukayila; ***Marathi***: tamaku, tambaku; ***Punjabi***: tamaku; ***Sanskrit***: dhumrapatra, kalanja, tamakhu; ***Tamil***: pugaiyilai; ***Telegu***: dhumrapatramu, pogaku.

Description

A stout, viscid annual, 1–3 m tall with a thick, erect stem and few branches. Leaves ovate, elliptic or lanceolate, usually 12–30 cm long, usually sessile with a cuneate base or sometimes petiolate with a frilled wing or auricle. Flowers white to pale red, borne in compoundly branched pannicles with a distinct rachis. Fruit (capsule) narrowly elliptic ovoid or orbicular, 1.5–2 cm long; seeds spherical or broadly elliptic, 0.5 mm long, brown with fluted ridges. Flowers and fruits during the summer months.

Distribution and habitat

Although the species is now unknown in its wild state, it is believed to have originated in northwestern Argentina and Bolivia. It was cultivated in the pre-Columbian era in the West Indies, Mexico, Central America and northern South America. Numerous cultivated varieties have been grown throughout India since its introduction to present-day Gujarat and Maharashtra in the early 17th century.

Medicinal properties and uses

The leaves have been used in traditional Indian medicine as a sedative, antispasmodic and vermifuge. They are also considered antiseptic, emetic and narcotic. A decoction of the leaves is applied locally for muscle relaxation associated with joint dislocation, to relieve pain and irritation of rheumatic swellings, and to treat strangulated hernia, orchitis and skin diseases. Among the tribal inhabitants of Surguga District in northeastern Madhya Pradesh, the warmed leaves are applied to the testes to treat hydrocele. The oil extracted from the leaves is useful for treatment of arthralgia, gout, lumbago and rheumatism.

References

Chatterjee and Pakrashi (1995), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935), Kumar and Jain (1998), Yoganarasimhan (1996).

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Physalis minima L. var. *indica* C.B. Clarke

Common names

Bengali: bantepariya, bontaperi; ***Gujarati***: parpoti, popti; ***Hindi***: bandapariya, chirpoti, tulatipati; ***Kannada***: gudde hannu, guppatte gida; ***Malayalam***: njodi njotta; ***Marathi***: chirboti, dhanmori; ***Punjabi***: habbikaknaj; ***Sanskrit***: lakshmipriya, tankari; ***Tamil***: tholtakkali; ***Telegu***: buddabudama, kupanti.

Description

A herbaceous annual up to 30 cm high, with striate stems, often pubescent. Leaves alternate, ovate-sinuate, 2.5–6.3 cm long and 1.3–3.8 cm wide, more or less pubescent, apex acute, base cuneate, margins shallowly toothed or lobed; petiole 1.3–3.2 cm long. Flowers solitary, pedicels very slender, nodding, 3–8 mm long; calyx 3–5 mm long, teeth triangular, acute; corolla yellow with purple spots at the base. Fruit (berry) round, 8–12 mm in diameter, green, many-seeded, entirely enclosed in the enlarged, 5–10-ribbed, membranous calyx. Seeds smooth or tuberculate, rugose, compressed, 2 mm in diameter, orange-yellow. Flowers and fruits almost throughout the year.

Distribution and habitat

Distributed almost throughout India as a common weed in cultivated fields and other open, disturbed sites to an elevation of about 2000 m in the Himalayas. Found elsewhere in tropical Asia, Africa and Australia.

Medicinal properties and uses

The fruits are considered to be tonic, diuretic and purgative. They are used to treat dropsy, gonorrhoea, gout and certain urinary diseases, and as an ingredient in a medicinal oil used to treat enlargement of the spleen. The leaf-juice, mixed with water and mustard oil, is used as a remedy for earache. The root is used in Ayurvedic practice to treat blood disorders, fever and bronchial asthma. In Siddha, the whole plant is used in the treatment of diabetes, dysuria and to relieve swellings.

References

Chatterjee and Pakrashi (1995), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

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Solanum erianthum D. Don

Botanical synonym

Solanum verbascifolium auct. non L.

Common names

English: common nightshade, potato-tree; ***Hindi***: asheta; ***Kannada***: kadusindhe, kadusonde, kallarthi, savudangi, sonde; ***Malayalam***: chundai, chunta, erichunta, malanjunta; ***Marathi***: kutri; ***Punjabi***: kalamewa, kharawine, ola, tiari; ***Sanskrit***: gandira, pathi, priyamkari, vidari; ***Tamil***: anaichundai, chundai, malaichundai, sundai; ***Telegu***: budama, rasagadi; ***Urdu***: ola.

Description

An erect, single-stemmed, unarmed shrub 2–6 m tall with a widely spreading crown and bifurcating branches and branchlets; older bark grey, younger stems densely covered with pale yellowish or grey stellate hairs. Leaves usually clustered towards the ends of branchlets, elliptic-lanceolate, 10–20 cm long and 5–15 cm wide, apex acuminate, base acute, margins entire, dark green above, paler beneath, stellate-pubescent on both surfaces; main nerves about 8 pairs; petioles 2–3.8 cm long. Flowers numerous, in woolly dichotomous corymbose cymes; peduncles stout, 2.5–10 cm long, pedicels 3–10 mm long, stout; calyx 6 mm long, cup-shaped, densely woolly, teeth 2.5 mm long, broadly deltoid, acute; corolla white, nearly 1.3 cm long, deeply divided, lobes 8 mm long, elliptic-lanceolate, acute, stellately hairy outside. Fruits (berries) 8 mm in diameter, globose, yellow when ripe, covered with small stellate hairs; seeds 1.5 mm in diameter, slightly rugose.

Distribution and habitat

Occurs wild throughout the tropical and subtropical parts of India, the Andaman Islands and elsewhere in the Indo-Malaysian region, northern Australia and tropical America. Also cultivated in South India for its fruits, which are eaten in curries.

Medicinal properties and uses

A decoction of the root is used to treat body pains, vertigo and urinary troubles. Leaves are given to women suffering from vaginal discharge. In Unani practice, the dried plant is ground with warm water and applied externally to relieve inflammation and burns.

References

Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

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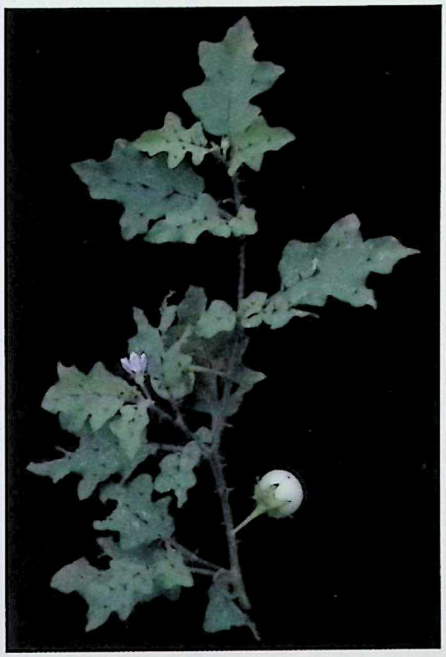
Solanum indicum L.

Common names

Bengali: byakura, gurkamai, titveguna; ***English***: poison-berry; ***Gujarati***: mhotiringni, motaringni, ubhibhoringni, ubhiringni, vadaringni; ***Hindi***: barhanta, birhatta, vadikadheri; ***Kannada***: badane, habbagulla, kadusonde, kempugulla, kirigulla, sonde; ***Malayalam***: cheruchunda, cheruvazhudhena, nilavalutina; ***Marathi***: dorli, inotiringni, ringani, thorlidorli; ***Oriya***: bonobryhoti, bryhoti, nunnuniyakoli; ***Punjabi***: kandyari, katank-kari; ***Sanskrit***: bhantaki, vanavrintaki, vrihati; ***Tamil***: karimulli, mulli, papparamulli; ***Telegu***: chittimulaga, kakamunchi, tella-mulaka; ***Urdu***: janglibringan.



Description

A much-branched spiny herb or small shrub up to 1.8 m tall with a stout, often purple stem; prickles large, sharp, with a long compressed base, often slightly recurved. Leaves 5–15 cm long and 2.5–7.5 cm wide, ovate in outline, subentire or with a few large triangular-ovate lobes, sparsely prickly and hairy on both sides, base cordate, cuneate or truncate, often unequal-sided; petioles 1.3–2.5 cm long, prickly. Flowers borne in racemose extra-axillary cymes, peduncles short, pedicels 6–13 mm long, stellate-hairy and prickly; calyx 3 mm long, stellately hairy, teeth triangular, 1.5 mm long; corolla pale purple, 0.8 cm long, outside covered with darker purple stellate hairs, lobes 5 mm long, deltoid-ovate, acute. Fruits (berries) globose, about 0.8 cm in diameter, dark yellow when ripe, glabrous; seeds 0.4 cm in diameter, minutely pitted. Flowering occurs mainly between August and October and fruiting in November and December in central India, earlier in southern India.

Distribution and habitat

Very common throughout tropical and subtropical India to an elevation of about 1500 m. Also occurs naturally in Sri Lanka, Malaysia, China and the Philippines.

Medicinal properties and uses

The root is considered carminative and expectorant, and is used for treating asthma, coughs and catarrhal affections, dysuria and colic. Its extract is reportedly given to infants to check vomiting following intake of milk among the Kathodias

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and Raibaris of Rajasthan. A decoction of the root is prescribed as a tonic and is also used to facilitate childbirth. The pounded root is used for treating nasal ulcers. The juice of the leaves is mixed with the juice of ginger root to stop vomiting. The leaves and fruit, mixed with sugar, are used as an external application to relieve itching. The dried, powdered fruit pulp is given to children to expel worms among the Kondhs of southwestern Orissa. The partially ripened fruits are eaten in the form of preserves, chutneys and in curries; the leaves are also eaten as a vegetable.

References

Bhatt *et al.* (1999), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Girach (1992), Kirtikar *et al.* (1935).

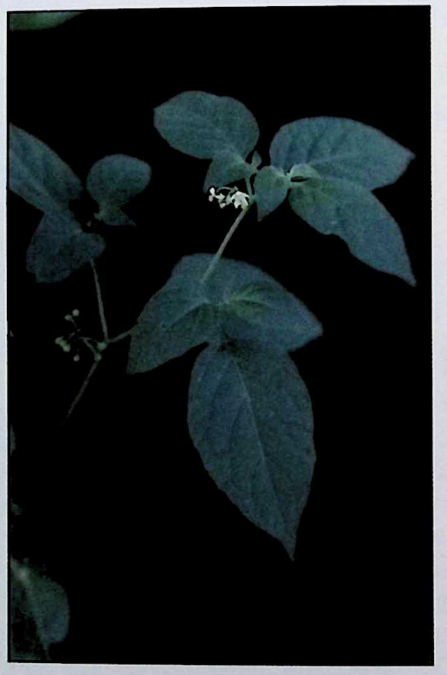
Solanum nigrum Mill.

Botanical synonym

Solanum americanum sensu Trimen

Common names

Bengali: gurkamai, kakmachi, tulidun; ***English***: black nightshade, common nightshade, poisonberry; ***Gujarati***: piludi; ***Hindi***: gurkamai, kabaiya, makoi; ***Kannada***: karikaachi gida; ***Malayalam***: manatakkali; ***Marathi***: ghati, kakmachi, kamoni, laghukavali, meko; ***Punjabi***: kachmach, kambei, mako, riaungi; ***Sanskrit***: kakamachi, kakamaci; ***Tamil***: manattakkali; ***Telegu***: gajjuchettu, kachchipundu, kachi, kamanchi, kasaka; ***Urdu***: makoya.



Description

A variable annual herb up to 1 m tall with an erect, glabrous or sparsely pubescent stem and divaricate branching pattern. Leaves 2.5–9 cm long and 2–5 cm wide, ovate or ovate-lanceolate, glabrous, thin, margins subentire to sinuately toothed, tapering into the petiole, apex subacute or acuminate; petioles 2 cm long. Flowers small, white, borne in drooping, umbellate 3–8-flowered cymes; peduncles 0.6–2 cm long, slender, pedicels 0.6–1 cm long, very slender; calyx 3 mm long, 5-toothed, glabrous; corolla 2–8 mm long, divided more than halfway down into 5 oblong, subacute, reflexed lobes, stamens exposed, yellow. Fruits (berries) globose, 5–8 mm in diameter, red, yellow or purplish-black when ripe; seeds numerous, disc-shaped, 1.5 mm in diameter, yellow, minutely pitted. Flowers and fruits year-round, but chiefly between February and July.

Distribution and habitat

Widely distributed throughout the tropical and warm temperate regions of the world, it is found throughout India and Sri Lanka to an elevation of 2100 m as a weed in open, disturbed habitats such as gardens, cultivated lands and on roadsides.

Medicinal properties and uses

All parts of the plant are considered demulcent, alterative, cardiotonic, antidiabetic,

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diuretic and laxative. The whole plant is used internally to relieve cardialgia and gripe. The fresh juice of the whole plant is used for treating dropsy, gonorrhoea, haemoptysis, piles, dysentery, enlargement of the liver and spleen, and is considered effective for treating cirrhosis of the liver; its decoction is considered antispasmodic and narcotic. The leaves and tender shoots are boiled and eaten in many parts of India by patients suffering from dropsy. A decoction of the leaves is used as a diuretic and laxative. The warmed leaves are applied to relieve painful and swollen testicles; and the leaf paste is used as a poultice to provide relief for gout, rheumatic joints and skin diseases. The berries are considered to have tonic, diuretic and cathartic properties and are used to treat anasarca and heart diseases. They are a domestic remedy for fevers, diarrhoea, ulcers and eye troubles. A decoction of the berries and flowers is prescribed for relieving cough and cold. The ripe fruits are commonly eaten in pies and preserves.

References

Chatterjee and Pakrashi (1995), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935), Sivarajan and Balachandran (1994).

Solanum surattense Burm. f.

Botanical synonyms

Solanum mccanni Sant., *S. xanthocarpum* Schrad. & Wendl.

Common names

Bengali: kantakari; ***English***: yellow-berried nightshade; ***Gujarati***: bhonyaringani, bodiringni; ***Hindi***: katai, kateli, ringani, satyanasi; ***Kannada***: chikkasonde, kantakari, kante, nelagulla, ramagulla; ***Malayalam***: kantakarichunta, kantankattiri, puttachunta; ***Marathi***: bhonyaringani, bhuiringani, kanteringani; ***Oriya***: ankrantibhejibegun, bryhotibegonia, chokrobryhoti, kontna, onkoranti; ***Punjabi***: kandiari, kandyali, mahori, warumba; ***Sanskrit***: brhati, kantakari, nidigadhika; ***Tamil***: kandangattiri, sutturam, udaravani, udavani; ***Telegu***: challamulaga, pinnamulaka, nelamulaka, vankuda; ***Urdu***: bhakkatiya, katilla.

Description

A very prickly, diffuse herb up to 1.2 m tall; stem somewhat zig-zag; younger branches clothed with dense stellate tomentum; prickles straight, yellow, shining, *c.* 1.3 cm long. Leaves ovate-oblong or elliptic, sinuate or pinnately 7–11-lobed, 3.5–10 cm long and 1.5–5.7 cm wide, apex obtuse or subacute, base usually rounded and unequal-sided, hairy on both surfaces, armed along the midrib with long, sharp yellow prickles *c.* 1 cm long; petioles 1.3–2.5 cm long, stellately hairy and prickly. Flowers borne in extra-axillary few-flowered cymes; calyx nearly 1.3 cm long, densely hairy and prickly, tube short, globose, lobes 11 mm long, linear-lanceolate, acute, prickly outside; corolla purple, 2 cm long, lobes deltoid, acute, hairy outside. Fruits (berries) smooth, globose, 1.2–2

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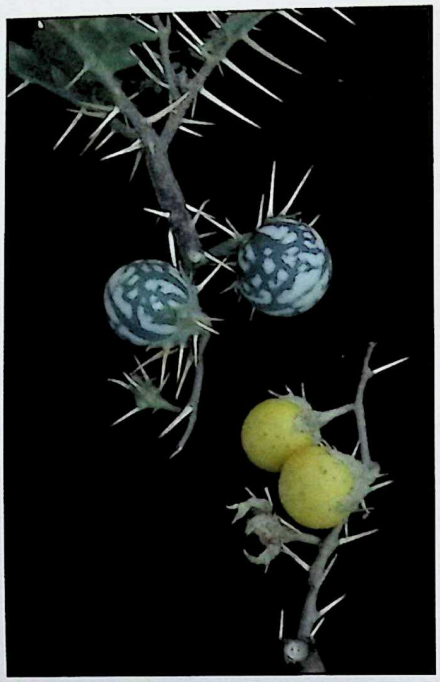
cm in diameter, yellow or white with green veins; seeds smooth, compressed, reniform, 2.5 mm in diameter. Flowers and fruits mainly from March to July.



Distribution and habitat

Native to tropical Asia from the Indian subcontinent to Polynesia. Common throughout India in disturbed, open habitats such as degraded pastures and secondary forests, along roadsides and railway lines.

Medicinal properties and uses

The whole plant is considered alterative, anti-asthmatic, asperient, astringent, bitter, digestive, diuretic, febrifuge and pungent; it is used to treat bronchitis, cough, constipation and dropsy. Its decoction is used for treating gonorrhoea and promoting conception. The plant is an ingredient of the Ayurvedic compound drug *Arkadhi*, used to treat dengue fever, acute bronchitis and fevers accompanying chest affections. The leaf-juice, mixed with black pepper, is prescribed for rheumatism. The root is considered anti-asthmatic, anti-emetic, diuretic and expectorant, and is used in various forms for treating catarrhal affections and chest pains. Mixed with the root of *Tinospora cordifolia* (*Menispermaceae*), it is used to treat cough and fever. It is also an important ingredient of the well-known Ayurvedic medicine *Dasamula*, used in the form of a decoction or an electuary for coughs, asthma and chest pains. The stem, flowers and fruits are bitter and carminative. The crushed flowers are given orally to relieve diarrhoea in children among the Bhils of Rajasthan. The juice of the berries is used to treat sore throat. Among the Kondhs of southwestern Orissa, the fruit pulp is placed in dental cavities to relieve toothache. A medicated oil prepared by boiling the powdered fruits in mustard oil is used to treat skin eruptions on the feet among the inhabitants of Bhadrak District in northeastern Orissa.

References

Bhatt and Mitaliya (1999), Bhatt *et al.* (1999), Chatterjee and Pakrashi (1995), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Girach (1992), Girach *et al.* (1997), Joshi (1989), Kirtikar *et al.* (1935), Sivarajan and Balachandran (1994).

Solanum torvum Sw.

Common names

Bengali: gota begun, gothbegun, titbaigun; ***Kannada***: bovasonde, kadusonde, sonde, sundakkayi; ***Malayalam***: chunta, kattuchunta; ***Sanskrit***: brhati, gosthabartaku; ***Tamil***: kottukkattari, malaichundai, sundai, sundaikai; ***Telegu***: chundaikai, kondavuste, kottuvastu, ustekaya.

Description

An erect herb or shrub up to 3 m tall, stems often tinged with dark purple, stellate-tomentose, unarmed or with short, curved prickles. Leaves ovate-lanceolate, margins entire, sinuate or shallowly lobed, apex acute or obtuse, base rounded or cordate, stellately tomentose beneath, usually

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without prickles. Flowers white, borne in dense lateral racemes; calyx glandular-hairy, never armed, lobes lanceolate, acuminate *c.* 0.6 cm long when in flower, 0.9–1 cm in diameter when in fruit; corolla white, stellate-pubescent outside, 7–8 mm long, lobes lanceolate, subacute. Fruits (berries) globose, 1–1.3 cm in diameter, smooth, yellow or orange-red when ripe; seeds smooth. Flowers and fruits from March to July.

Distribution and habitat

Found in open, disturbed habitats throughout the tropical parts of India and the Andaman Islands, except in very dry regions. Also found in Malaysia, the Philippines and in tropical America.

Medicinal properties and uses

The plant is considered sedative, diuretic and digestive. The fruits, which are cooked and eaten as a vegetable or dried and preserved, are considered useful for relieving indigestion and treatment of spleen and liver enlargement. A decoction of the fruits is given to relieve coughs. The powdered seeds, mixed with mustard oil, are used as a massage oil for treating skin eruptions among the tribal inhabitants of Udaipur District in Rajasthan. The leaves have haemostatic properties. The roots are used in the form of a poultice to promote healing of cracks in the feet. In Ayurvedic practice, the roots and berries are used as a substitute for those of *Solanum anguivi*.

References

Chatterjee and Pakrashi (1995), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Katewa and Arora (1997), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

Withania somnifera (L.) Dunal.

Botanical synonyms

Physalis flexuosa L., *P. somnifera* L.

Common names

Bengali: ashvaganda, ashwagandha; ***Gujarati***: asan, asoda, aswaghanda, ghoda, ghodakum; ***Hindi***: asgand, ashwagandha, punir; ***Kannada***: amangura, aswagandhi, hiremaddina gida, kiremallinagida, pannaeru, viremaddlinagadde; ***Malayalam***: amukkiram, amukkuram, pevetti; ***Marathi***: askandha, kanchuki, tilli; ***Oriya***: asugandha; ***Punjabi***: ak, asgand, isgand; ***Sanskrit***: ashvagandha, asvagandha, turangigandha; ***Tamil***: amkulang, amukkura, amukkuram-kilangu, aswagandhi; ***Telegu***: panneru, pannerugadda, pulivendram; ***Urdu***: asgandanagaori.

Description

An erect, evergreen, greyish tomentose shrub 0.3–2 m tall, with fairly long, stout, fleshy, whitish-brown roots. Leaves simple, alternate or subopposite, broadly ovate, glabrous, 5–12 cm long and 2.5–7 cm wide, apex subacute, base unequal, margins

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entire, finely stellate-pubescent beneath; main nerves about 6 pairs; petioles 0.3–1.7 cm long, channelled above. Flowers greenish or lurid-yellow, sessile or short-pedicelled, borne singly or in few-flowered axillary umbellate cymes *c.* 1 cm long; calyx 5 mm long in flower, tomentose, teeth 2.5 mm long, linear from a deltoid base; corolla 8 mm long, lobes lanceolate, acute, pubescent outside. Fruits (berries) smooth, globose, 6 mm in diameter, orange-red when mature and enclosed in the inflated, persistent, papery, slightly 5-angled calyx; seeds numerous, yellow, discoid or reniform, 2.5 mm in diameter. In central India, flowering occurs mainly between January and March and fruiting between February and April.

Distribution and habitat

Widely distributed in the Old World tropics and subtropics from the Mediterranean and parts of Africa, through the Arabian peninsula eastwards to India and Sri Lanka. It is found as a weed in waste places and in hedges throughout the drier regions of India. It is occasionally cultivated for its medicinal roots.

Medicinal properties and uses

The roots are considered alterative, germicidal, aphrodisiac and diuretic; they are used in Ayurveda to treat ulcers, fever, dyspnoea, cough, consumption, dropsy, rheumatism, toxicosis and leucoderma, as a sedative in cases of senile debility and nervous exhaustion, and to restore memory loss. They are an important ingredient of several important Ayurvedic preparations (such as *Ashwagandha ghrita*, *Ashwagandarista* and *Narayana taila*) prescribed as aphrodisiacs, galactagogues and for treating lumbago and rheumatism. The powdered roots, mixed with equal parts of honey and *ghee* (clarified butter), are thought to be beneficial for impotence or seminal debility. Among the rural inhabitants of Bhavnagar District in Gujarat, the roots are used to treat general debility, insomnia and painful urination. The roots as well as the bruised leaves are also used externally to treat ulcers, painful swellings, carbuncles and scabies. The total alkaloids present in the roots produce relaxant and antispasmodic effects on intestinal, uterine, bronchial and blood-vascular muscles. The fruits and seeds are diuretic. The leaves are considered anthelmintic and bitter, and their infusion is given to relieve fever. The bruised leaves are sometimes applied to relieve sore eyes, and their paste is used in Ayurveda to promote healing of ulcers and scrofula.

References

Bhatt *et al.* (1999), Chatterjee and Pakrashi (1995), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935), Sivarajan and Balachandran (1994), Yoganarasimhan (1996).

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Sterculiaceae

Byttneria herbacea Roxb.

Botanical synonym

Buettneria herbacea Roxb.

Common name

Bengali: kambraj.

Description

A branched, unarmed herb with a perennial woody rootstock. Leaves 2.5–6 cm long, glabrous, ovate-lanceolate, apex acuminate, base cordate or rounded, 3–5-nerved, margins toothed, paler beneath; petioles 0.4 cm long; stipules linear, as long as petioles. Flowers small, purplish, borne in axillary cymes; sepals linear-lanceolate, reflexed; petals with long, slender tips and bifid appendages. Fruits (capsules) pale green, sometimes reddish-tinged, 0.6 cm in diameter, covered with soft spines.

Distribution and habitat

Commonly found in peninsular India from Gujarat southwards to Tamilnadu and in Bihar.

Medicinal properties and uses

A paste prepared from the plant is applied to promote healing of bone fractures and sprains in the Gandhamardan Hills of Orissa. In Bihar, the rootstock is ground and rubbed on joints to relieve swelling. It is also used in combination with other plant drugs (fruits of *Aegle marmelos* (*Rutaceae*), roots of *Ficus religiosa* (*Moraceae*) and *hesel* gum) to treat cholera and diarrhoea, and in the treatment of gynaecological disorders. Among the Gonds of Uttar Pradesh, the root extract along with that of *Asparagus racemosus* (*Asparagaceae*) is taken for treatment of spermatorrhoea and leucorrhoea.

References

Asolkar *et al.* (1992), Brahmam and Saxena (1990), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Singh and Prakash (1994), Yoganarasimhan (1996).

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Eriolaena hookeriana Wight & Arn.

Common names

Hindi: bhoti; ***Kannada***: dandiyase, dhasiro; ***Malayalam***: guakasi; ***Marathi***: bhondia-dhaman; ***Oriya***: bonohandi; ***Tamil***: nar botku, peruduppai, pulicce-vandi; ***Telegu***: narubotuku.

Description

A large shrub or small deciduous tree up to 12 m tall with grey bark. Leaves broadly ovate, 3.5–13.5 cm long and 3–16 cm wide, stellately pubescent beneath, apex acuminate, base cordate with 5–9 main nerves, margins crenate-dentate; petioles 2–9 cm long, pubescent. Flowers yellow, 4–5 cm across, borne in 2–7-flowered cymes, peduncles 8–15 cm long; bracteoles deeply cut into numerous linear segments up to 2 cm long; calyx lobes 2–2.5 cm long; petals yellow, obovate, 1.5–2 cm long with thicker, tomentose claws. Fruit (capsule) woody, 10-valved, ellipsoid to ovoid, 2–3 cm long; seeds winged at apex. In central India, flowering occurs between March and September, depending on locality; fruits mature from September to January.

Distribution and habitat

Throughout India, from the Gangetic plain southwards through peninsular India to an altitude of 1500 m in the Western Ghats.

Medicinal properties and uses

A poultice made from the pounded roots is used to promote healing of wounds.

References

Asolkar *et al.* (1992), CSIR (1948–1992).

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Guazuma ulmifolia Lam.

Botanical synonyms

Guazuma tomentosa Kunth., *Theobroma guazuma* L.

Common names

Bengali: nipaltunth; ***English***: bastard cedar, honey fruit tree, musket tree; ***Kannada***: bhadrakshi mara, bucha, rudrakshi; ***Malayalam***: rudraksham, utharasham; ***Oriya***: debodaru; ***Tamil***: rudrasam, tenbachai, thenmaram, tubakki; ***Telegu***: rudraksha, thenechettu, udrikpatta.

Description

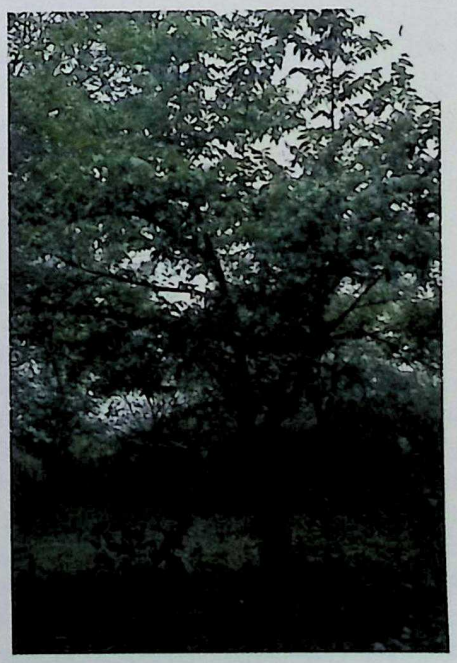
A small or medium-sized tree up to 25 m tall with brown, rough bark and spreading branches. Leaves ovate to oblong or lanceolate, 3–21 cm long and 2–6 cm wide, base unequally cordate, apex acuminate, margins serrate, scabrid above, pubescent beneath, base 5–7-nerved; petioles 0.5–2 cm long. Flowers small, yellow or purple, borne in axillary thyrsiform cymes 2–4 cm long; sepals 5, at first spathaceous; petals 5. Fruit (capsule) globose or ellipsoid, woody, tubercled, 5-celled, indehiscent, purplish-black, 1.2–4 cm long and 1.2–2.5 cm wide, containing numerous, ovoid, grey seeds 2.5–4 mm long and 1.8–2 mm wide.

Distribution and habitat

Native to tropical America, cultivated in gardens and as a roadside shade tree in tropical and subtropical India, especially in the south. Occasionally naturalized in the vicinity of villages and towns.

Medicinal properties and uses

Though not widely used in India, the roasted seeds are considered astringent, the bark is tonic and demulcent, and an extract of the leaves is reported to reduce corpulence. In Java, the fruits are used to treat



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stomach disorders. In the West Indies, the inner bark is used to treat elephantiasis; an infusion of old bark is considered sudorific and useful in the treatment of skin diseases.

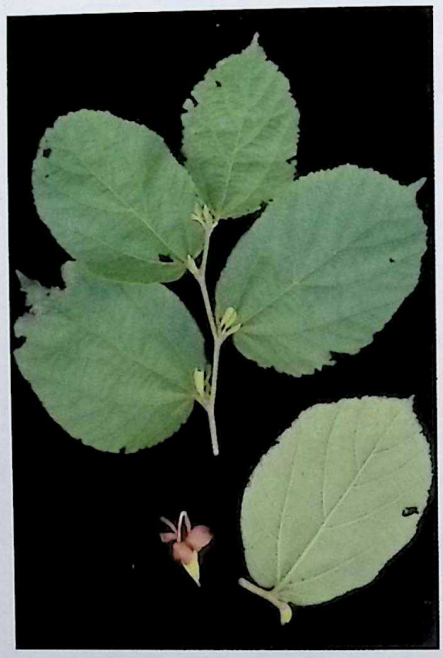
References

Asolkar *et al.* (1992), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

Helicteres isora L.

Common names

Bengali: antamora, atmora; ***English***: East India screw tree; ***Gujarati***: murdasing; ***Hindi***: bhendu, jonkaphal, marorphal, marorphali; ***Kannada***: kavargi, yedamuri; ***Konkani***: kivani; ***Malayalam***: isvarmuri, kaivun; ***Marathi***: kevani, kewan, maradasing, varkati; ***Oriya***: kaval, modimodi, murimuri, murmuria, ovla; ***Punjabi***: bhendu, jonkaphal, kupasi, marorphali; ***Sanskrit***: avarttani, mringashinga; ***Tamil***: kaiva, valumberi; ***Telegu***: gubadarra, kavanchi, nuliti, syamali, valambiri; ***Urdu***: marorphali.



Description

A semi-deciduous shrub or small tree up to 5 m tall with grey bark, its young shoots covered with stellate hairs. Leaves bifarious, 4–20 cm long and 2.5–15 cm wide, oblong, obovate or nearly round, base cordate, 3-nerved, apex shortly acuminate, margins crenate-serrate, upper surface closely dotted with stellate hairs; petioles 0.5–1.5 cm long; stipules subulate, 0.6 cm long. Flowers solitary or in sparse clusters, 2.5–4 cm long, with red reflexed petals turning pale blue when old. Fruits 2–4 cm long, greenish-brown, beaked, cylindrical, with spirally twisting carpels, which on ripening untwine and scatter the enclosed small seeds. Two varieties are distinguished: var. *tomentosa* (distributed mainly in northern and central India), in which leaf undersurfaces are glabrous; and var. *glabrescens* (distributed in southern India), in which both leaf surfaces are nearly glabrous. In central India, flowering occurs between July and December and fruiting from October to March; trees generally leafless between February–March and April–May.

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Distribution and habitat

Occurs naturally in Pakistan, India, Nepal, Myanmar (Burma) and Sri Lanka eastwards to southern China, Indochina, western Malesia and northern Australia; introduced to the West Indies. It is typically found on forest edges and in the understorey of dry secondary forests and thrives on rich humus soils on sites receiving at least 30 cm annual rainfall well-distributed throughout the year.

Medicinal properties and uses

The root and stem barks are considered to be expectorant, demulcent, astringent to the bowels and anti-galactagogue; they are applied topically to treat scabies. The juice of the root is used to treat empyema, stomach disorders and in the Konkan it is used to treat diabetes and snake bite; among the Gonds of Uttar Pradesh and the tribal inhabitants of southern Andhra Pradesh, it is given for treatment of dog-bite and rabies. The stem bark is prescribed for diarrhoea, dysentery and biliousness. A paste made from the leaves is used to treat skin ailments, including eczema. The pods are fried and given to children to kill intestinal worms. An aqueous extract of the seeds is sometimes used to treat dysentery and to relieve stomach pains. The dried fruit is demulcent and mildly astringent, and reportedly useful for treatment of intestinal ailments; it is prescribed for colic, flatulence, diarrhoea and dysentery. Among the Bhils of Rajasthan, an extract of the fruit is given orally to children to relieve diarrhoea. The powdered fruits mixed with neem oil (from fruits of *Azadirachta indica*: *Meliaceae*) are used as a massage oil for treatment of paralysis among the tribal inhabitants of eastern Bihar. The powdered seeds are also used in this region to relieve stomach pains. The inner bark yields a useful fibre.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Jha and Varma (1996), Joshi (1989), Kirtikar *et al.* (1935), Singh and Prakash (1994), Vijaya Kumar and Pullaiah (1998).

Heritiera littoralis Ait.

Common names

Bengali: sundri; ***English***: looking-glass tree; ***Kannada***: chandmara; ***Malayalam***: mukuram, nakam; ***Marathi***: kolland, sundrichand; ***Tamil***: chomuntri, kannadiyilai; ***Telegu***: adavibadamu.

Description

A small to medium-sized evergreen tree, occasionally up to 25 m tall, typically with a twisted, stunted stem, and thin, wavy buttresses; bark grey, longitudinally furrowed. Leaves simple, ovate, oblong or elliptic, 12.5–20 cm long and 5–10 cm wide, coriaceous, glabrous, shining above, silvery and scaly beneath; petioles stout, 0.5–2 cm long. Flowers small, orange-coloured, unisexual, borne in lax tomentose panicles up to 18 cm long. Fruit ellipsoid, *c.* 2.5 cm long, with a rudder-like ridge, glabrous and glossy.

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Distribution and habitat

Widely distributed in the Old World tropics, in eastern Africa and from India eastwards throughout Southeast Asia to tropical Australia, Hawaii and New Caledonia. In India it is found, never commonly, in the inland zone of mangrove forests along the coasts of peninsular India, the Sundarbans (in West Bengal) and the Andaman Islands; often planted in gardens.

Medicinal properties and uses

The fruits are considered stomachic and tonic. A decoction of the seeds is given to relieve diarrhoea and dysentery. The twigs are used as toothbrushes and the seeds are edible.

References

Asolkar *et al.* (1992), Chopra *et al.* (1969), CSIR (1948–1992).

Melochia corchorifolia L.

Botanical synonyms

Melochia concatenata L., *Riedleia corchorifolia* DC.

Common names

Bengali: tikiokra; ***Hindi***: bilpat; ***Malayalam***: seruvuram; ***Oriya***: chyeron, dasokerotan, nolita; ***Tamil***: pinnakkuppundu, punnakkukkirai; ***Telegu***: ganugapindikura, sittantakura, tutturubenda.

Description

An erect, branched, annual or perennial woody herb, 0.1–2.5 m tall, stems and branches nearly glabrous. Leaves very variable in size and shape, oblong-lanceolate, narrowly ovate or ovate, 2.5–10 cm long and 1.2–7 cm wide, apex acute, base cuneate to truncate, margins crenate-serrate, sometimes obscurely lobed, glabrous on both surfaces or with a few scattered stellate hairs; petioles 0.3–2.5 cm long, slender; stipules lanceolate, ciliate, 0.3–1 cm long. Flowers small, white or pink, densely clustered in axillary and terminal or cymes. Fruits (capsules) depressed globose, pea-sized, valves sparsely hairy; seeds angular, mottled black and grey, not winged.

Distribution and habitat

Widely distributed in the Old World tropics and subtropics; introduced into the New World, becoming widespread in the southern USA and elsewhere. Occurs throughout tropical and subtropical India from Kumaon to Sikkim to an altitude of 1200 m, southwards through Madhya Pradesh, Gujarat, Maharashtra, Karnataka and Tamilnadu. Typically found in shady, moist habitats along streams and riverbanks, forest margins and in disturbed habitats such as roadsides and fallow fields. Flowers and fruits from September to October in the dry deciduous forests of northern Maharashtra.

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Medicinal properties and uses

The stems and leaves, boiled in oil, are used on the Malabar coast as a remedy for bites from water-snakes. A decoction of the leaves and roots is used to treat dysentery.

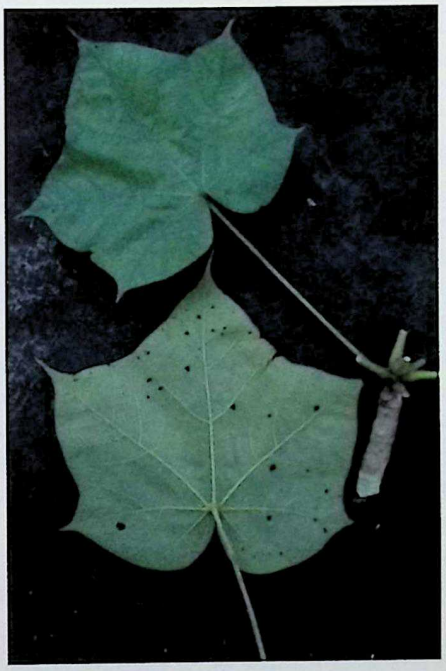
References

Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935).

Sterculia urens Roxb.

Common names

Bengali: buli; ***Gujarati***: kada, kagdol, karai; ***Hindi***: gular, gulu, karrai, katira, kulu; ***Kannada***: bhutali, kempudale, pinari; ***Konkani***: pandruk; ***Malayalam***: kithondi, thondi, tonti; ***Marathi***: gwira, kandol, karai, pandruk; ***Oriya***: gudalo, kavili; ***Sanskrit***: arjuna, balika; ***Tamil***: kavalam, sigapputtanaku, tanakku, vellaipputtali; ***Telegu***: errapunikichettu, ettaponaku, kalvi, kavili, tabsu, tanuku, tapasi.



Description

A medium-sized deciduous tree up to 15 m tall with a short trunk, spreading branches; bark smooth, thin, papery, greyish-white, pale green or copperish; young parts more or less pubescent. Leaves simple, clustered at the ends of the branches, 15–25 cm long and wide, palmately-sinuately 5-lobed, slightly pubescent above, softly velvety beneath, lobes entire, acuminate, base cordate, 7-nerved; petioles terete, 12.5–23 cm long, velvety tomentose. Flowers numerous, small, 0.6–0.9 cm in diameter, greenish-yellow, spotted with purple, with a disagreeable fetid odour, borne in dense pyramidal terminal panicles up to 25 cm long, appearing before the leaves at the ends of branches. Follicles 4–6, red or yellowish-brown, radiating, ovoid-oblong, approximately 2.5 cm in diameter, coriaceous, yellow bristly pubescent with stinging hairs; seeds 3–6, oblong, black. In central Indian deciduous forests trees are leafless between October and June; flowering occurs between December and February; fruits mature from March to April.

Distribution and habitat

Common in dry deciduous forests and open grasslands on shallow soils on exposed hill-slopes in the sub-Himalayan hills from the Ganges eastwards, Gujarat, Rajasthan, and in central and southern India to northern

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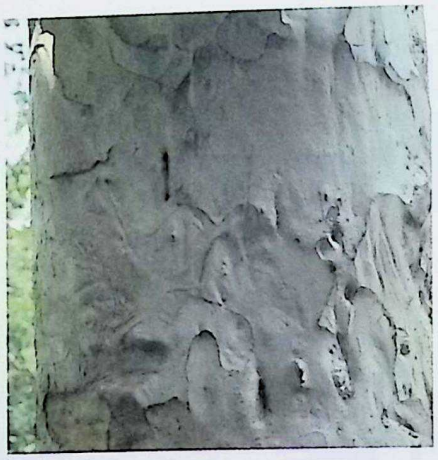
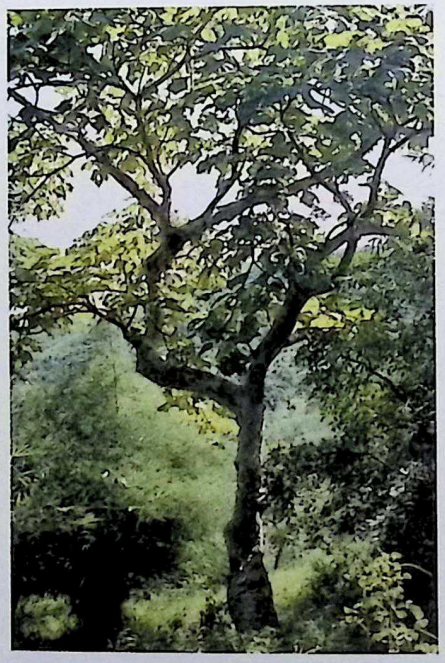
Karnataka; also reported in Mizoram and in Sri Lanka. The tree is often associated with *Boswellia serrata* (*Burseraceae*).



Medicinal properties and uses

The bark yields a useful gum of commercial importance, with properties similar to those of gum tragacanth (obtained from *Astralagus* spp.: *Fabaceae-Papilionoideae*). It is used in pharmaceutical and medicinal preparations, such as lozenges, emulsions, lotions, sprays and pastes; among the Santhalis, it is used for treating throat affections. Among the tribal inhabitants of Sundargarh District in Orissa the gum is given with sugar-candy to relieve diarrhoea and dyspepsia. In Surguja District in northeastern Madhya Pradesh, the gum, soaked in water and mixed with either sugar or milk, is given orally for diarrhoea and dysentery; the gum is applied locally and the juice of the stem bark taken orally to treat piles; and the root, pounded with black pepper, is taken with water to relieve fever. A paste of the young leaves is used externally to relieve chapped or cracked skin by the Bhils in Rajasthan. The leaves and tender branches, when steeped in water, yield a mucilaginous extract useful for treating pleuro-pneumonia in cattle.



References

Chopra *et al.* (1956), CSIR (1948–1992), Joshi (1989), Kirtikar *et al.* (1935), Kumar and Jain (1998), Mukherjee and Namhata (1990).

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Tiliaceae

Corchorus aestuans L.

Botanical synonym

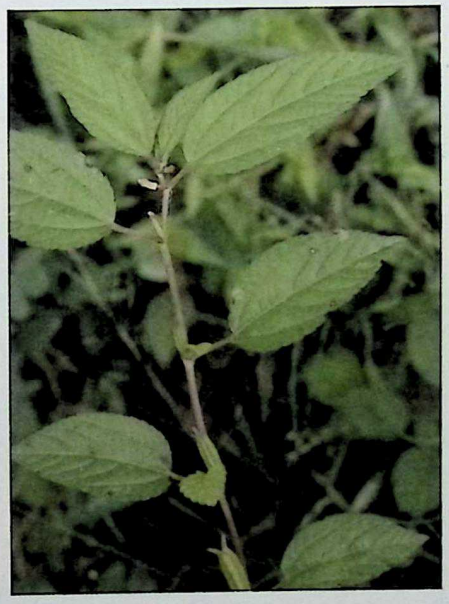
Corchorus acutangulus Lam.

Common names

Sanskrit: cancu, cuncuh.

Description

An erect or prostrate annual herb 30–60 cm tall, often much-branched from the base. Leaves ovate or ovate-oblong, apex acute, base rounded, margins crenate or serrate, 3–5-nerved from the base; petioles slender, to 3 cm long; stipules narrowly ovate-filiform, 6–10 mm long, persistent. Flowers yellow, borne in 2–3-flowered extra-axillary fascicles; sepals narrowly oblong-obovate, apiculate, *c.* 4 mm long and 0.8 mm wide; petals narrowly obovate, longer than sepals, the claw ciliolate. Fruit (capsule) erect, narrowly oblong-cylindrical, 1.5–3.5 cm long and 3–5 mm wide, 6-angled with 3 pairs of wings elongated into a conspicuous bifid appendage; seeds many, rhomboid, *c.* 1.5 mm long, blackish. Flowers and fruits between September and November in central Indian deciduous forests.



Distribution and habitat

A pantropical species originally from tropical America; it is found throughout tropical and subtropical India.

Medicinal properties and uses

The seeds are reportedly stomachic; sometimes used to treat pneumonia. Among the Bondo tribals of southern Orissa and the

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tribal inhabitants of Prakasam District in southern Andhra Pradesh, a leaf poultice or a paste of the leaves is applied to the forehead to relieve headaches. An ethanolic extract of the plant reportedly possesses anti-cancer properties.

References

Aminuddin and Girach (1991), Asolkar *et al.* (1992), Chopra *et al.* (1956), Vijaya Kumar and Pullaiah (1998).

Corchorus olitorius L.

Common names

Bengali: banpat, bhungipat, phunjipat, koshta, lalitapat, nalitapat; ***English***: tossa jute; ***Gujarati***: chhunchho; ***Hindi***: koshta, pata; ***Marathi***: chunch, motichunch; ***Oriya***: jhoto, joto, kaunria; ***Punjabi***: banphal; ***Sanskrit***: brihachanchu, singgika, patta; ***Tamil***: peratti; ***Telegu***: parintakura.

Description

An erect, annual herb with slender stems, 60–120 cm tall. Leaves 6.3–10 cm long and 3.8–5 cm wide, ovate-oblong to elliptic-lanceolate, with stellate hairs and without basal bristle-like lobes, margins serrate, the lower teeth elongated into a filiform appendages over 6 mm long, apex acute or acuminate, base rounded, 3–5-nerved; petioles 2–2.5 cm long; stipules subulate, 0.6–1 cm long. Flowers pale yellow, borne 1 or 2 together, axillary or leaf-opposed; sepals 3 mm long, oblong, apiculate; petals 5 mm long, oblong-spathulate. Capsule glabrous, erect, linear, cylindrical, 3–7 cm long, 5-valved, longitudinally 10-ribbed with purplish streaks along the grooves; seeds trigonous, black. Flowers and fruits between July and November in most parts of peninsular India.

Distribution and habitat

Pantropical in distribution, it is commonly found in fields and forest undergrowth in many parts of India. Occasionally cultivated, particularly in West Bengal.

Medicinal properties and uses

The leaves are demulcent, tonic and diuretic; they are used for treatment of chronic cystitis, dysuria and gonorrhoea. An infusion of the leaves and tender shoots is considered tonic and slightly febrifuge; a cold infusion of the dried leaves is used as a bitter tonic that is given to patients recovering from acute dysentery to help restore appetite and strength. In Ayurvedic practice the leaves are considered astringent to the bowels, alterative and alexiteric; they are used to treat abdominal tumours and piles. The dried, roasted, powdered plant is used to treat visceral obstructions and, in South India, as a demulcent. The seeds are purgative.

References

Asolkar *et al.* (1992), Chatterjee and Pakrashi (1992), Chopra *et al.* (1956, 1969), Kirtikar *et al.* (1935).

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Corchorus trilocularis L.

Common names

Gujarati: kadvichhunchhdi; ***Hindi***: kadukostakadvapat; ***Kannada***: kaduchunchali, tandassir; ***Marathi***: kaduchunch; ***Sanskrit***: dirghachanchu, kaunti.

Description

An erect annual herb with more or less hairy branches. Leaves 2.5–10 cm long and 2–3.2 cm wide, elliptic to oblong-lanceolate, apex acute or obtuse, base rounded or cuneate; margins serrate, the lower teeth often elongated into filiform appendages; petioles 0.6–1.2 cm long. Flowers borne in short cymes; bracts lanceolate-subulate; sepals 6 mm long, linear-oblong, acuminate; petals oblong, slightly longer than sepals. Fruit (capsule) 3–4-angled and -valved, 5–7.5 cm long, with a short, erect beak, hairy when young with stiff stellate hairs; seeds trigonous, black. Flowers and fruits between September and January in Madhya Pradesh and western Maharashtra and from April to January in Karnataka.

Distribution and habitat

Widely distributed in tropical and southern Africa, the Arabian peninsula, Afghanistan, Pakistan and India. It is a common weed found throughout peninsular India in cultivated land and in moist, open habitats.

Medicinal properties and uses

In Ayurveda, the leaves are considered laxative, stimulant, tonic and aphrodisiac; the seeds are used to treat tumours, stomach troubles, skin diseases and scabies. The seeds are also reportedly used to relieve obstruction of the abdominal viscera. Among the tribal inhabitants of western Maharashtra, the dried seed powder is given with hot water to relieve fever.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956), Kirtikar *et al.* (1935), Nadkarni (1954), Upadhye *et al.* (1994).

Grewia hirsuta Vahl

Common names

Hindi: gur-sukri, kukurbicha, sri-gur-sukri; ***Marathi***: govli; ***Sanskrit***: gudasarkara, nagabala; ***Telegu***: chimachipuru, jibilike; ***Urdu***: kakarundehrumi.

Description

A small, straggling shrub 30–90 cm tall with numerous branches arising from the base; branchlets densely and softly stellate-hirsute. Leaves 5–10 cm long and 2.5–3.8 cm wide, oblong to linear-lanceolate, apex acute, base 3-nerved, more or less oblique and rounded to acute, margins bluntly serrate, teeth often irregular in size, glabrescent above, velvety beneath; petioles 2.5–5 mm long, hirsute; stipules subulate, to 8 mm long, lanceolate, persistent, densely hirsute to velvety on both surfaces. Flowers white when

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young, turning yellow, borne in axillary 2–4-flowered cymes; peduncles axillary, solitary or paired, 0.5–2.5 cm long, slender; pedicels 0.4–1 cm long; sepals 5 mm long, oblong; petals 3 mm long, oblong, claw distinct. Fruits (drupes) fleshy, 7.5–10 mm in diameter, more or less 2–4-lobed, shining orange to brown when ripe with scattered hairs, 4-seeded, pulp sweet. Flowering occurs between July and September and fruiting from November to January in central India.

Distribution and habitat

Native to tropical Asia from Pakistan east of the Indus to Myanmar (Burma) and Sri Lanka; also reported in northern Australia. In India it is a common forest understorey plant in the sub-Himalayan tract up to 1400 m, and in peninsular India from Bihar southwards; also found along roadsides and other open, disturbed habitats.

Medicinal properties and uses

The leaves may be either bitter or tasteless: the bitter leaves are used in Unani medicine to lessen inflammations, as an anthelmintic, and to treat nose and eye diseases; the roots of this variety are reportedly used in Unani practice to treat cholera, hydrophobia, kidney pain and piles. The leaves and fruit of the second variety (with tasteless leaves) are used to treat splenic enlargement, eye troubles, piles, rheumatism, pain in the joints and in the breasts. The fruits and roots are used to treat acute diarrhoea and dysentery among the Santhalis. Among the tribal inhabitants of eastern Bihar, the leaf paste and that of the root (pounded in water) are used externally to promote healing of boils.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956), Jha and Varma (1996), Kirtikar *et al.* (1935).

Grewia sclerophylla Wall.

Botanical synonym

Grewia scabrophylla Roxb.

Common names

Gujarati: padekhado; ***Hindi***: pharsia; ***Kannada***: darsuk, kadukadele; ***Marathi***: khatkhati, pandharidhaman; ***Tamil***: kattukkadali, punaippidukkan; ***Telegu***: bankajana.

Description

A small deciduous shrub with a woody rootstock, 0.6–1.5 m tall, branches arising from the base, young parts rough, stellate-tomentose. Leaves broadly elliptic or suborbicular, sometimes slightly lobed, 10–18 cm long and 7.5–15 cm wide, margins irregularly serrate, the larger teeth glandular-tipped, apex shortly acuminate, base usually oblique, cuneate, rounded or slightly cordate, 3–5-nerved, scabrid above, densely stellate-pubescent and usually white or greyish beneath; petiole 0.5–1.5 cm long, very stout, usually with several pairs of large glands near the top and on the leaf margin; stipules linear. Flowers white, *c.* 2.5 cm in diameter, 2–3 together on each peduncle, axillary; pedun-

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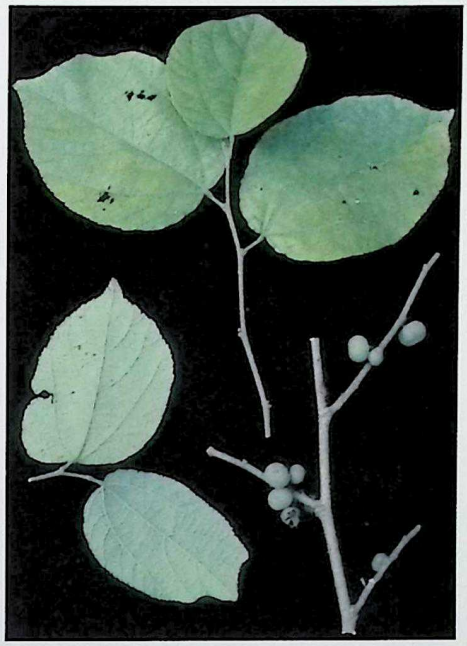
cles 1–4 together, 1.2 cm long, tomentose; sepals pubescent, yellowish inside. The edible fruits (drupes) are globose, crustaceous, 1.7–2.5 cm in diameter, depressed at the top, 2-lobed, slightly hairy, purple or brown when ripe, 4-seeded. Flowers mainly in July and August and fruits in October and November in central Indian deciduous forest regions.



Distribution and habitat

Common in open grasslands from the sub-Himalayan tract from Kumaon eastwards to Myanmar (Burma) and southwards through peninsular India.

Medicinal properties and uses

The root is prescribed for coughs and to treat irritable conditions of the intestines and bladder; its decoction is used as an emollient enema.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956), Kirtikar *et al.* (1935).

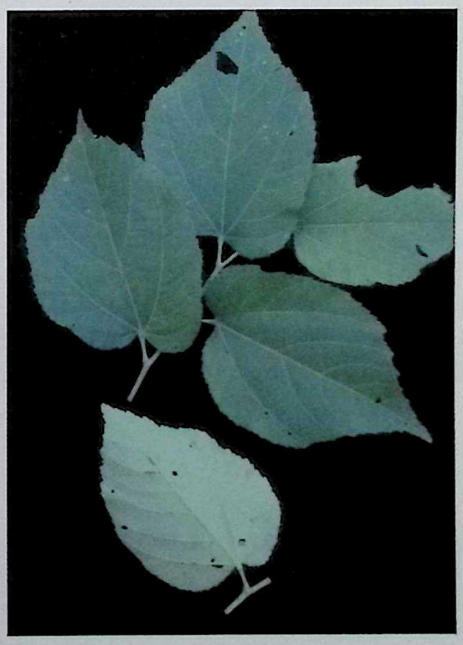
Grewia tiliaefolia Vahl

Botanical synonym

Grewia asiatica var. *tiliaefolia* Brandis

Common names

Bengali: dhamani, pharsa; ***Gujarati***: dalmon, dhaman; ***Hindi***: dhamani, dhamin, phalsa, pharsa; ***Kannada***: butale, dadsal, jana, tadagana; ***Konkani***: butale, dadsale, damoni; ***Malayalam***: chadicha, satachi, una; ***Marathi***: dhaman, karavarani; ***Oriya***: dhaman, dhamono; ***Sanskrit***: dhanurvriksha, dhanurvksah, dharmana; ***Tamil***: sadachi, tarra, unu; ***Telegu***: charachi, ettatada, jana, nulijana, tada, udupai.



Description

A small to medium-sized deciduous tree up to 7 m tall with smooth greyish-brown, vertically fissured bark and pubescent twigs. Leaves 7–12 cm long and 5–7 cm wide, generally ovate or orbicular, upper surface glabrous or minutely stellately hairy, lower surface hoary-tomentose, apex acuminate, margins crenate-dentate, base cordate and unequal, usually 5-nerved; petioles 0.5–1.8 cm long, pubescent; stipules 0.7–1 cm long, lanceolate, leafy, auriculate, with a rounded lobe on the lower side. Flowers small, yellow, umbellate, tomentose, in

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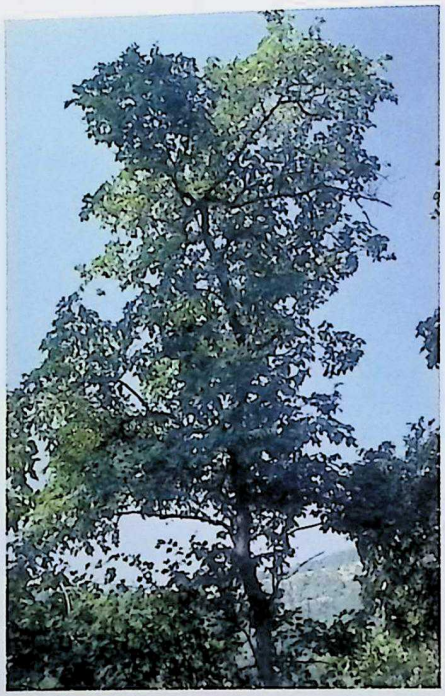

axillary 4–8-flowered cymes; sepals 8 mm long, oblong, pubescent outside; petals about half as long as sepals, oblong or spathulate, entire or notched; gland about one-third the length of the petal, densely white-villous on the margin. The fruit is an edible drupe 0.7 cm in diameter, black, globose or indistinctly 2–4-lobed; stones 1–2-celled. Flowers and fruits between May and October in central India.

Distribution and habitat

Occurs naturally in east tropical Africa, India, Nepal, Bangladesh, Myanmar (Burma) and Sri Lanka. In India it is found in deciduous forests in the sub-Himalayan region from the Jumna eastwards to Nepal and Bihar, and southwards through peninsular India to Tamilnadu.

Medicinal properties and uses

The powdered stem bark is taken in small doses to treat dysentery. Among the tribal inhabitants of Prakasam District in southern Andhra Pradesh, a paste of the powdered stem bark mixed with sugar and milk is given to treat diarrhoea. The root bark is applied externally to relieve cow-itch. A mucilage obtained by washing the root bark with water is given with millet (*Panicum miliaceum*: *Poaceae*) flour as a remedy for dysentery in the Konkan. The powdered wood is emetic, and is used as an antidote to opium poisoning.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956), Kirtikar *et al.* (1935), Upadhye *et al.* (1994), Vijaya Kumar and Pullaiah (1998).

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Triumfetta rhomboidea Jacq.

Botanical synonyms

Triumfetta angulata Lam., *T. bartramia* L. nom illegit.

Common names

Bengali: benokra, bunokra; ***English***: burweed; ***Gujarati***: jhipato; ***Hindi***: chikti, chiriyari; ***Kannada***: kadubende; ***Konkani***: tupkadi; ***Marathi***: jhinjhira, jhinjudi, kutrevandare, nichardi; ***Oriya***: bojoromuli, jotojoti; ***Sanskrit***: jhinjhirita, jhinjhirita; ***Tamil***: aadaiotti, ottupullu, puramutti; ***Telegu***: chirusitrika, tutturubenda.

Description

A herbaceous perennial up to 1.5 m tall, often woody at the base; branches slender, pubescent with simple hairs when young, becoming glabrous. Leaves variable: lower leaves 5–7.5 cm long and broad, usually 3-lobed, irregularly serrate, clothed with simple and stellate hairs on both surfaces and simple hairs on the nerves beneath, base cordate or cuneate, 3–7-nerved; petioles 3–4 cm long; upper leaves usually simple with very short petioles. Flowers yellow, 5–6 mm across, in dense terminal and leaf-opposed cymes; sepals oblong, hooded and apiculate; petals shorter than the sepals, ovate-oblong, ciliate at base, claw very long. Fruit small, globose or ovoid, 4–6 mm in diameter, with small, smooth, hooked, spines. In central Indian, flowering occurs between August and December and fruiting from September to January.

Distribution and habitat

A pantropical weed found on roadsides and in other disturbed, open habitats throughout tropical and subtropical India to an altitude of 1200 m in the Himalayas.

Medicinal properties and uses

In Ayurveda, the roots are considered bitter, acrid, tonic, styptic, galactagogue, aphrodisiac and cooling, and are used to treat dysentery. Both the bark and fresh leaves are used to treat diarrhoea and dysentery. Pounded roots are sometimes given to treat intestinal ulcers and their hot infusion is used to treat gonorrhoea and to facilitate childbirth. The fruits, flowers and leaves are mucilaginous, demulcent and astringent, and used to treat gonorrhoea and to promote parturition when delayed. The leaves and flowers is used against leprosy. The inner bark yields a soft, glossy fibre that is much used in Tamilnadu.

References

Chatterjee and Pakrashi (1992), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935).

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Typhaceae

Typha angustata Bory & Chaub.

Botanical synonyms

Typha angustifolia auct. non L., *T. australis* Schum. & Thonn.

Common names

Bengali: hogla, kaw; ***English***: bulrush, elephant grass, reed mace; ***Gujarati***: ghabajario, panjabris, pario; ***Hindi***: patera; ***Kannada***: anechondu, anejondu, apu, maribala; ***Marathi***: eraka, janglibajri, motitrina, pankanis, pun, rambana; ***Punjabi***: kai, kundar, patera, pitz; ***Sanskrit***: eraka, gundra; ***Tamil***: sambu; ***Telegu***: dabbujammu, jambu, jammu, jammugaddi.

Description

A tall, robust perennial marsh plant, usually 1.5–3 m high with a creeping, branched rhizome. Leaves distichous, semicylindrical above the leaf sheath, spongy, up to 3 m long and 2–2.5 cm wide, often longer than the flowering stalk, narrower above the sheath. Flowers minute, borne on cylindrical spikes 0.8–2.2 cm in

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diameter, the male and female spikes often widely separated on the stalk, sometimes on different plants; male spikes 25–50 cm long, consisting of deep-yellow anthers; female spikes 22–38 cm long, pale brown, flowers mixed with clavate pistillodes. Fruit fusiform, dehiscent by an apical lid.

Distribution and habitat

Found in marshy habitats throughout India to an altitude of about 1700 m. Also found in temperate and subtropical Europe, northern Africa, North America and northern Asia.

Medicinal properties and uses

In Ayurveda the plant is considered useful for treating urinary calculi, dysuria, strangury, erysipelas and syphilis. The rootstock is considered astringent and diuretic. The ash of the lower spikes is believed to promote healing of wounds. The young shoots, inflorescence and rhizomes are edible.

References

Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

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Ulmaceae

Holoptelea integrifolia (Roxb.) Planch.

Botanical synonym

Ulmus integrifolia Roxb.

Common names

English: Indian elm, jungle cork tree; ***Gujarati***: kanjho, waola; ***Hindi***: chilbil, chirhol, kanju, karanji, papri; ***Kannada***: kaladri, nilavahi, rasbija, tapasi, thavasai; ***Malayalam***: aval, nettaval; ***Marathi***: papara, vavala, vavli; ***Oriya***: daurango, dauranja, dharango, taruda; ***Punjabi***: arjan, khulen, papri, rajain; ***Sanskrit***: chirabilvah, putikaranjah; ***Tamil***: aya, ayil, kanci, tambachi, vellaya; ***Telegu***: nauli, nemali, pedanevili, thapasi.

Description

A large spreading, deciduous tree up to 18 m tall, with grey, pustular bark that is smooth when young, exfoliating in corky scales on older trees. Leaves alternate, elliptic-ovate, 8–13 cm long and 3.2–6.3 cm wide, glabrous, margins entire (those of seedlings and shoots often serrate), apex acute or acuminate, base rounded or cordate, main nerves 5–7 pairs; petioles 0.6–2.5 cm long; stipules lanceolate. Flowers usually male and hermaphrodite mixed, small, greenish-yellow to brownish, pubescent, borne in short racemes or fascicles at the scars of fallen leaves; sepals often 4, pubescent, 1.5–2.5 mm long. Fruit an orbicular samara, 2.5 cm in diameter, with membranous, reticulately veined wings; seed flat. The crushed bark and leaves emit an unpleasant odour. Flowers and fruits between February and May in deciduous forest regions of central India.

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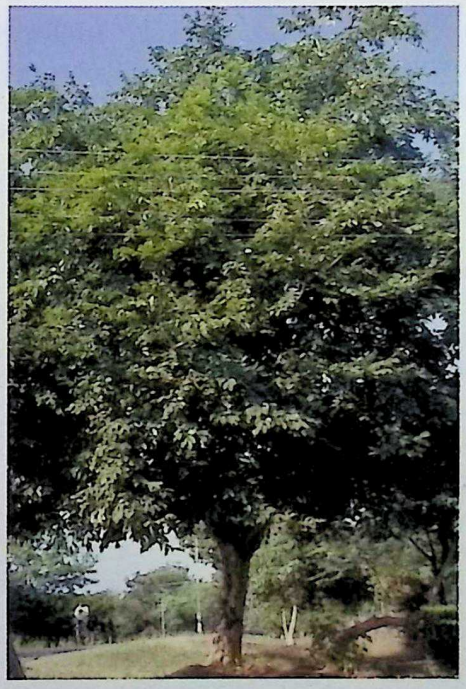

Distribution and habitat

Native to tropical Asia from northern and peninsular India to Myanmar (Burma), Indochina and Sri Lanka. Found most commonly in deciduous forests to an altitude of about 600 m in the sub-Himalayan hills to Assam, in Bihar and in western and southern regions of peninsular India.

Medicinal properties and uses

In Ayurveda the bark and leaves are used medicinally; they are considered useful for treating oedema, diabetes, leprosy and other skin diseases, dyspepsia, intestinal disorders, piles and sprue. The mucilaginous juice squeezed from the boiled bark is reportedly used as an external application to relieve rheumatic swellings; the bark is subsequently dried and powdered and applied for the same purpose. The seeds and stem bark paste are used externally to treat ringworm, and the latter for scabies. Among the tribal inhabitants of southern Bihar, the stem bark paste is applied around boils to promote suppuration. The tribal inhabitants of western Maharashtra used the leaves, boiled in coconut oil, as an external application for wounds. Among tribal women in Surguja District or eastern Madhya Pradesh, the fruit pulp, pounded with black salt, is given to treat menstrual disorders.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Girach and Aminuddin (1995), Kirtikar *et al.* (1935), Kumar and Jain (1998), Sivarajan and Balachandran (1994), Upadhye *et al.* (1994), Yoganarasimhan (1996).

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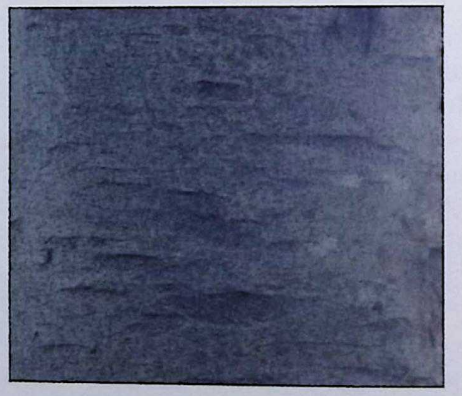
Trema orientalis (L.) Blume



Botanical synonyms

Celtis orientalis L., *Sponia wightii* Planch.

Common names

Bengali: chikan, chikun, jibon, jupong; ***English***: charcoal tree, oriental nettle; ***Gujarati***: gol; ***Hindi***: gio; ***Kannada***: gorlu, gurklu, karuhale, kiruhale, koruhale; ***Malayalam***: ama, amathalai, arni, malantotali, ratthi; ***Marathi***: gol, kapashi, kargol, ranambada; ***Oriya***: jivani, kharkas; ***Sanskrit***: jivanti; ***Tamil***: ambaratthi, chenkolam, mini, mudalai, munnai, oman, yerralai; ***Telegu***: budamuru, chakamaanu, gaddanelli, kaakamushti, morali, priyalu.

Description

A fast-growing, short-lived evergreen tree or a large shrub up to 10 m tall with straight, spreading, pubescent branches, its trunk ringed with stipular scars; bark smooth, white or bluish-green to greenish-brown; branchlets pubescent. Leaves alternate, 7–13 cm long and 3.2–4.5 cm wide, obliquely ovate-oblong or oblong-lanceolate, pubescent beneath, margins crenate-serrulate, apex acuminate, base unequal-sided, rounded or subcordate; petioles 0.6–1.5 cm long; stipules white-pubescent. Flowers minute, whitish or greenish, borne in axillary, pubescent cymes, the male cymes more compact than the female and usually on different trees. Fruits (drupes) ovoid, 0.4 cm in diameter, glabrous, black when ripe. Flowers and fruits between November and April in central Indian deciduous forests.

Distribution and habitat

An early pioneer species found in forest clearings, fallow lands and other open, disturbed habitats throughout the deciduous and semi-evergreen forest regions of India up to an altitude of 2400 m; also occurs naturally in Sri Lanka, Myanmar (Burma), Malaysia and China.

Medicinal properties and uses

A decoction of the root is used for treating diarrhoea and blood in the urine. The bark is reported to be used in preparing a poultice for relieving muscular pain. The root, bark and leaves are reportedly used to treat epilepsy. The fruits are edible and have a sweet taste.

References

Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

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Verbenaceae

Callicarpa tomentosa (L.) Murray

Botanical synonyms

Callicarpa farinosa Roxb., *C. lanata* L., *C. lobata* Clarke, *C. wallichiana* Walp., *Tometax tomentosa* L., *Tomex tomentosa* L. ex Dassow

Common names

Bengali: massandari, muttura; ***English***: great woolly Malayan lilac; ***Hindi***: bastra; ***Kannada***: ardri, doddanathada gidda, ibbanne, ruchipatri; ***Malayalam***: chruthekku, nai-kumbil, nallapompil, pichenkala, temperuvallam, teregam, thinperivelam, tondi, tontitterakam; ***Marathi***: aisar, isvar, karavati, pondi; ***Sanskrit***: bharnjimashandari; ***Tamil***: katkomal, kattukkumil, vetrilaipattai, vettilaipatta, vettilaippattai.

Description

A shrub or sometimes a small tree up to 8 m tall; bark grey, soft, with a peculiar, slightly aromatic odour; branchlets densely clothed with an easily detachable felt of grey or fulvous stellate hairs. Leaves usually crowded at the ends of branches, ovate or elliptic-lanceolate, 15–23 cm long and 7.5–10 cm wide, margins entire or toothed, apex acuminate, base rounded, cordate or acute, dark green, smooth above, with dense yellowish-grey tomentum beneath; main nerves 6–9 pairs, petioles 2.5–4.5 cm long, stout, tomentose. Flowers pink or purple, borne in divaricately branched, tomentose axillary cymes; bracts linear, to 1.2 mm long; calyx 2.5 mm long, campanulate, faintly 4-lobed; corolla 4 mm long, glabrous, tube 2.5 mm long, campanulate, lobes 4, unequal, subquadrate, rounded. Fruits (drupes) green turning purple or

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black when ripe, globose, to 4 mm in diameter, smooth, shining.

Distribution and habitat

Widely distributed in tropical Asia from Nepal and Bhutan through most of India, Sri Lanka and Bangladesh eastwards through peninsular Southeast Asia to the Philippines, Indonesia, New Guinea and northern Australia. In peninsular India it is found in the Konkan and in evergreen forests of the Western Ghats in Maharashtra, Karnataka, Kerala and in Tamilnadu to an elevation of 1200 m, typically at the edges of forest clearings.

Medicinal properties and uses

An aqueous extract of the leaves is used as an antiseptic to dress wounds and boils, and to relieve itches. Boiled in milk, the leaves are used as a mouthwash to relieve aphthae. The roots are used to treat skin affections in northern India. A decoction of the bark and roots is reportedly used to relieve fever, remove hepatic obstructions and to treat skin diseases. In Ayurvedic practice, the flower and fruit are used as a substitute for those of *Callicarpa macrophylla* (*Priyangu* in Sanskrit) to treat epilepsy, diseases of the nervous system, haemorrhage, oedema, cardiac diseases and dysuria.

References

Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

Clerodendrum inerme (L.) Gaertn.

Botanical synonym

Volkameria myrtifolia Portensch. ex Moldenke

Common names

Bengali: banjai, batraj, benjuen, bonjoi, bunjumat; ***English***: garden quinine; ***Gujarati***: dariajai; ***Hindi***: batraj, binjoam, lanjai, sangan-kuppi; ***Kannada***: kundali, naitakkilai, nayitakkali, vishamadhari; ***Malayalam***: nirnochi, nirnotijil; ***Marathi***: koivel, vanajai; ***Oriya***: cholora; ***Sanskrit***: kundali; ***Tamil***: pinarichanganguppu, pinasangamkoppi, pinchil, sangam; ***Telegu***: eruppichha, pishinika, pisung, takkolkamu, utichettu.

Description

A much-branched, straggling or erect, evergreen shrub up to 2.5 m tall; bark dark brown to light grey, fissured, soft; branches and branchlets quadrangular. Leaves opposite, aromatic, succulent, generally 2–5 cm long and 1.3–2.5 cm wide, elliptic to narrowly lanceolate, apex obtuse, base acute; petioles 0.6–1 cm long. Flowers borne 3–9 together in axillary pedunculate 3–9-flowered cymes; peduncles slender, 1.3–4.5 cm long; bracts minute, linear or subulate; calyx 5 mm long, enlarged in fruit, teeth triangular, *c.* 1.2 mm long, acute; corolla white, tube slender *c.* 2.5 cm long, glabrous outside, very hairy inside, lobes subequal, 6–10 mm long,

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oblong, obtuse, with slightly crenulate margins; filaments very long, hairy at the base. Fruit (drupe) pyriform, 1.3–1.6 cm long, spongy, brown, in a veined persistent calyx, separating into 4 woody pyrenes. Flowers and fruits between March and June.

Distribution and habitat

A widely distributed, polymorphic species found along seacoasts, in salt marshes, mangrove and freshwater swamp forests and along muddy tidal riverbanks in tropical and subtropical Asia from India and Sri Lanka to Australia and the Pacific Islands; introduced and naturalized in many parts of the Caribbean, coastal areas of Brazil, Zaire and Mauritius. In peninsular India it is found in coastal areas and on riverbanks in open, degraded sites and in hedges; often planted in gardens.

Medicinal properties and uses

The whole plant is used as a substitute for quinine and chirata (*Swertia chirayita*: *Gentianaceae*), given in the form of a tincture or decoction to treat intermittent and remittent fevers. The leaves are mucilaginous, bitter and fragrant; both the dried leaves and the juice of the fresh leaves and roots are considered alterative and are used to treat scrofula and venereal diseases. The leaf juice is a popular febrifuge in Maharashtra. The root, boiled in oil, is used as a liniment for treating rheumatism; the juice of the root is considered alterative. In Siddha, the root and leaf used to treat glandular swellings, eczema, leucorrhoea and scabies.

References

Asolkar *et al.* (1992), Chatterjee and Pakrashi (1995), Chopra *et al.* (1956), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

Clerodendrum phlomodis L. f.

Botanical synonyms

Clerodendrum multiflorum Burm. ex Kuntze, *C. phlomoides* Willd., *Volkameria multiflora* Burm. f.

Common names

Bengali: bataghni; ***Gujarati***: arani, arni, irun, urni; ***Hindi***: arni, piran, urni; ***Kannada***: taggi gida; ***Malayalam***: tirutali; ***Marathi***: airanamula, arani, arni, iran, takali; ***Oriya***: hontari; ***Sanskrit***: agnimantha, agnimanthah, vataghni; ***Tamil***: taludala, taludalai, thalanji; ***Telegu***: takkolamu, telaki.

Description

A large bushy shrub or small tree; bark light brown, fissured, with dull white lenticels; branches obtusely quadrangular, more or less pubescent. Leaves opposite, 1.7–6.8 cm long and 1.2–6 cm wide, ovate or subrhomboid, margins coarsely crenate-dentate or subentire, undulate, glabrous above and more or less puberulous beneath, apex acute or short-acuminate, base truncate or subcordate; petioles slender, 0.5–2 cm long. Flowers fragrant, borne in small, dichotomous, axillary, 3–9-flowered cymes arranged in a rounded terminal panicle;

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bracts obovate or lanceolate, acute, leafy; calyx *c.* 1 cm long, divided about halfway down, not enlarged in fruit, segments ovate, acutely acuminate, veined; corolla white or pinkish, tube 2–2.5 cm long, slightly pubescent outside, glabrous inside, lobes nearly equal, at least 6 mm long, elliptic, obtuse, veined. Fruit (drupe) black when ripe, succulent, broadly obovoid, 0.6–1.2 cm long, depressed, normally 4-lobed with 1 pyrene in each lobe. Flowers and fruits almost throughout the year, depending on locality; in central India, flowering occurs mainly between October and December, and fruiting from December to February.

Distribution and habitat

Native to southern Asia from the northwestern Himalayas and Baluchistan (in Pakistan) through India to Sri Lanka. Common in the drier parts of northern and peninsular India; often cultivated as a hedge plant.

Medicinal properties and uses

One of the ten drugs comprising the compound Ayurvedic formulation *Dasamula*, the aromatic roots are considered acrid, bitter, astringent, cardiotonic, carminative, laxative, stomachic and tonic. It is used to improve digestion and to treat constipation, fever, heart and neurological diseases, and rheumatism. A decoction of the roots is used in Maharashtra as a demulcent for treating gonorrhoea in southern India, and as a bitter tonic for children recovering from measles. The leaves are considered alterative, bitter and tonic; their juice is given in the treatment of syphilis. Among the rural and tribal inhabitants of Bhavnagar District in Gujarat, the leaf juice is given as a treatment for intestinal worms, dropsy, piles and obesity. In Ayurveda an infusion of the leaves is used to treat eruptive fevers, colic and flatulence.

References

Asolkar *et al.* (1992), Bhatt and Mitaliya (1999), Chatterjee and Pakrashi (1995), Chopra *et al.* (1956, 1969), Kirtikar *et al.* (1935), Sivarajan and Balachandran (1994), Yoganarasimhan (1996).

Clerodendrum serratum (L.) Moon.

Botanical synonyms

Clerodendron fortunatum Burm. ex Moldenke, *C. serrulatum* Spreng. ex Razi, *Volkameria serrata* L.

Common names

Bengali: bamanhati; ***Gujarati***: bharungi; ***Hindi***: barangi, bharangi, duma; ***Kannada***: bharangi, gantubarangi, kiritekki; ***Malayalam***: cherutekku, kankabharnni, kantani, napalu; ***Marathi***: bharangi; ***Oriya***: chinda, penjura; ***Sanskrit***: bharang, bharangi, bhargi, bharngi; ***Tamil***: angaravalli, chirudekku, kandubarangi, sirudekku, vadamadakki; ***Telegu***: bharangi, chiruteka, gantubarangi, panja; ***Urdu***: bharangi.

Description

A scarcely woody shrub up to 2.4 m high with bluntly quadrangular stems; young

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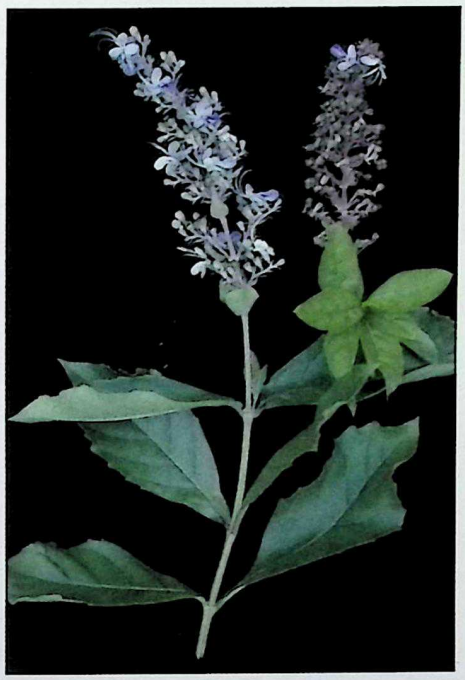
parts usually smooth. Leaves whorled and opposite, usually 12–15 cm long (sometimes much larger) and 5.7–6.3 cm wide, oblong or elliptic, apex acute, margins coarsely and sharply serrate, glabrous, base acute; petioles very stout, 0.6 mm long. Flowers pale blue, numerous, in lax pubescent dichotomous cymes in the axil of a large, leafy, pubescent bract 1.3–3.8 cm long, the cymes collectively forming a large, pyramidal, terminal panicle; calyx 5 mm long, cup-shaped, truncate, not enlarged in fruit, lobes very small, triangular; corolla tube 1 cm long, cylindrical, hairy within at the base, the 2 upper and 2 lateral lobes elliptic, obtuse, flat, spreading, 1 cm long, the lower lobe lip-like, more than 1.3 cm long, concave, deflexed. Fruit (drupe) purple when ripe, 0.6 cm long, broadly obovoid, somewhat succulent, normally 4-lobed with 1 pyrene in each lobe.



Distribution and habitat

Found throughout most of India and in Sri Lanka and the Malay peninsula.

Medicinal properties and uses

In the Unani and Ayurvedic systems, the roots are highly valued as a specific remedy for respiratory diseases. They are considered antispasmodic, carminative, expectorant, febrifuge and tonic; in Ayurveda they are used to treat anasarca, coryza, cough, dyspnoea, epilepsy and intermittent fevers. In Siddha the roots and leaves are used to treat asthma, fever, dropsy, mental disorders and coryza. They are also used in traditional medicine to treat rheumatism and dyspepsia, and to relieve cold symptoms. The leaves are also used as a febrifuge; boiled in oil and butter, they are made into an ointment used to treat headache and ophthalmia. The bruised seeds, boiled in buttermilk, are used as an aperient and in the treatment of dropsy.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956, 1969), Kirtikar *et al.* (1935), Sivarajan and Balachandran (1994), Yoganarasimhan (1996).

Gmelina arborea Roxb.

Botanical synonyms

Gmelina indica Burm. f., *G. rheedii* Hook., *G. tomentosa* Wall.

Common names

Bengali: gamari, gumar, gumbar; ***English***: candahar tree, white teak; ***Gujarati***: savan, shewan, shivan, sivan; ***Hindi***: gambhar, gumhar, kamhar, khambari, khamer, kumher, sewan; ***Kannada***: bachanige, gupsi, kashmiri, kumbudi, shivani; ***Konkani***: niuvon, sovony; ***Malayalam***: kumbil, kumil, kumilu; ***Marathi***: gamar, kamar, sewan, shewan; ***Oriya***: bhodropornni, gambhari, gombhari, kashmori; ***Punjabi***: ban, gumhar, kumhar; ***Sanskrit***: gambhari, kashmari, kasmari, kasmiri, sriparni; ***Tamil***: gumadi, kattanam,

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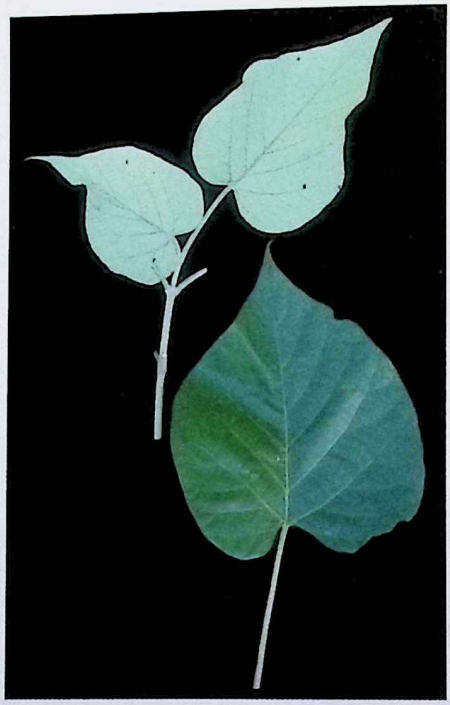
kumadi, perungumpil, umi, umi-thekku; ***Telegu***: gumarteku, gummadi, gummudu.



Description

A medium-sized deciduous tree up to about 30 m tall with smooth, somewhat corky, greyish-yellow bark; branchlets and young parts clothed with fine, white, mealy pubescence. Leaves opposite, broadly ovate, 10–25 cm long and 5–18 cm wide, base cordate, apex acuminate, margins entire, tawny tomentose beneath when young; petioles 5–7.5 cm long, with shining glands at the apex. Flowers yellow tinged with brown, usually in small cymes of about 3 flowers arranged along the branches of a densely fulvous-hairy panicle up to 30 cm long; bracts 8 mm long, linear-lanceolate; calyx 5 mm long, broadly campanulate, densely fulvous-hairy, teeth 5, small, triangular, acute; corolla brownish-yellow, densely hairy outside, up to 3.8 cm long, 5-lobed, 2-lipped, upper lip 1 cm or longer, divided into 2 oblong, obtuse lobes, lower lip nearly 2.5 cm long, 3-lobed. Fruit (drupe) fleshy, ovoid or pyriform, 2–2.5 cm long, turning orange-yellow when mature, 1- or 2-seeded. Flowers between February and April and fruits from April to July.

Distribution and habitat

Native from Pakistan southeastwards through India to Sri Lanka and Myanmar (Burma); extensively planted for timber in Southeast Asia, tropical Africa and Brazil. Found in deciduous forests throughout India, particularly in peninsular India to an elevation of 1600 m in the south, and in the Andaman Islands; never very common and always scattered (not gregarious).

Medicinal properties and uses

The astringent, bitter roots are considered digestive, cardiotonic, diuretic, laxative and a pulmonary and nervine tonic; they are used in Ayurveda to improve digestion, strengthen memory, to overcome giddiness and to treat fever, thirst, emaciation, heart diseases, nervous disorders and piles. They are an ingredient of the Ayurvedic preparation *Dasamula* used to treat puerperal diseases and appetite loss. In the form of an infusion or decoction it is prescribed for indigestion, fever and anasarca. The pulverized root is applied locally to treat gout. The fruits have a sweetish and bitter taste and are used as an ingredient in cooling decoctions used to relieve fevers, bilious conditions, anaemia, leprosy, ulcers and consumption; they are also thought to promote hair growth. In southern Orissa, the juice of the ripe fruits is taken with pome-

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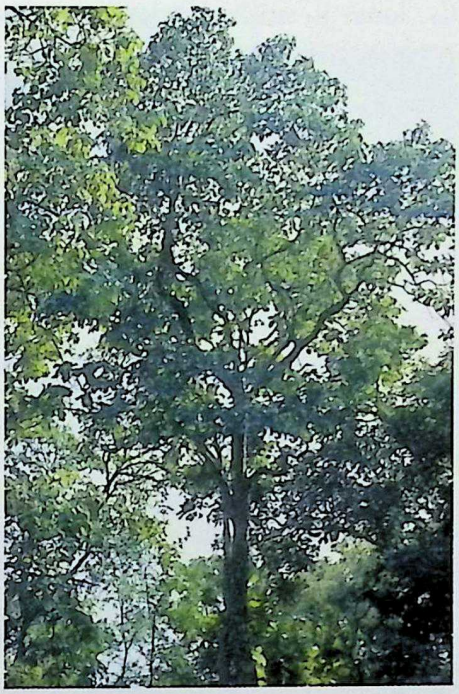
granate juice and sugar to treat dysentery. The flowers are given in the treatment of blood diseases and leprosy. The tender leaves are considered demulcent, and their juice is used to treat cough, gonorrhoea and to wash infected ulcers. A paste of the leaves is applied to the head to relieve headaches associated with fever. The Kolams of Andhra Pradesh use the pounded, boiled stem bark as an external application to treat whitlow.



References

Asolkar *et al.* (1992), Chatterjee and Pakrashi (1995), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Mohanty *et al.* (1996), Sivarajan and Balachandran (1994), Yoganarasimhan (1996).

Gmelina asiatica L.

Botanical synonyms

Gmelina coromandelica Burm. f., *G. inermis* Wight ex Wall., *G. parviflora* Roxb., *Premna parviflora* Roth

Common names

Bengali: bhadra; ***Hindi***: badhara, nag-phul; ***Kannada***: gulada mara, guludu, kalshivani, kumatha; ***Konkani***: sivni; ***Malayalam***: cherkumizhi, kumilamaram; ***Marathi***: lahan-shivan; ***Oriya***: gombhari, gopogombhari, nondano; ***Punjabi***: badhara; ***Sanskrit***: biddari, gopabhadra, kasmari, vikarini; ***Tamil***: kadambal, kumalai, kumil, kumizhaniaram, nilakkimnizh, nilakkumil; ***Telegu***: adavigummadi, challagumudu, chirugummudu, chirunelli, gummadi, shirigumudu.

Description

A large, spiny, straggling or sometimes climbing shrub with yellowish-white bark and rigid, horizontal branchlets, often shortened and spinous at the ends. Leaves highly variable, 1–9.5 cm long and 1.3–6 cm wide, ovate or elliptic, sometimes irregularly lobulate, lower surface coated with minute, round glands, apex acute or obtuse, base acute or rounded; petioles 0.5–3 cm long. Flowers large, nodding, bright yellow, borne in terminal, densely pubescent racemes; calyx 4–5 mm long, cup-shaped, pubescent, clothed with round, flattened

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glands, lobes 4, minute, triangular; corolla 2-lipped, 4.5 cm long, finely pubescent outside, tube narrow below, curved, inflated above, lobes 4, ovate. Fruits (drupes) ovoid or obovoid, 2 cm long, yellow when ripe, 1- or 2-seeded.

Distribution and habitat

Widely distributed in tropical Asia from India, Sri Lanka and Bangladesh through Myanmar (Burma) and Thailand to Malaysia, Indochina and southern China; also occurs naturally in La Réunion and Mauritius, and is cultivated in many parts of the tropics and subtropics. In peninsular India it is found in scrub forests, mainly in eastern and southern regions, occasionally planted in this region and elsewhere in India in gardens, particularly as a hedge plant.

Medicinal properties and uses

In Ayurvedic practice, the root, bark and fruit are used as substitutes for those of *Gmelina arborea*. The root is aromatic, mucilaginous, demulcent, alterative and astringent. It is used principally as a demulcent to treat catarrh of the bladder, but also for rheumatism, gonorrhoea, and as a blood purifier. In Unani, the root is considered aphrodisiac and expectorant; it is also used to relieve joint pains. Among the tribal inhabitants of southern Andhra Pradesh, a paste of the roots mixed with cloves is used to relieve toothache. The leaves and young shoots contain a thick, viscid, mucilage that is used to treat gonorrhoea and relieve painful urination. In Siddha, the roots and mucilaginous leaves are used to treat diarrhoea, digestive disorders, leucorrhoea, cystitis and oliguria. The fruit is applied to the forehead to relieve burning sensations in the eyes and to cool the body. The fruits are reportedly edible, and are also used as a soap substitute by the Irulars in Tamilnadu.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Kirtikar *et al.* (1935), Ragupathy and Mahadevan (1991), Rao *et al.* (1996), Yoganarasimhan (1996).

Lantana camara L. var. *aculeata* (L.) Moldenke

Botanical synonyms

Camara aculeata (L.) Kuntze, *Lantana aculeata* L., *L. aculeata* subsp. *normalis* Voss, *L. camara* auct. non L., *L. spinosa* L. ex LeCointe

Common names

Bengali: guye genda; ***English***: lantana, wild sage; ***Hindi***: kuri, raimuniya; ***Kannada***: aripu, hesike, kakke, kasutibu, lantanavaani, natahu, unnigida; ***Malayalam***: arippu; ***Marathi***: chandurang, ghaneri; ***Sanskrit***: caturangi, vanacchedi; ***Tamil***: arippu, unnichedi; ***Telegu***: pulikampa.

Description

A low, erect or subscandent shrub 1.2–2.4 m high, with quadrangular branches armed with stout recurved prickles; the plant has a strong odour of blackcurrants. Leaves opposite, 2.5–7.5 cm long and 1.5–4.3 cm wide, ovate or ovate-oblong, apex acute or subacute, base truncate or narrowed, margins crenate-serrate, rugose above, scabrid on both surfaces; petioles 5–13 mm long. Flowers 6 mm across, usually orange but varying from white to yellow, red or light purple, borne in pedunculate, axillary heads 2.5 cm across or on short spikes; peduncles 2.5–7.5 cm long; bracts 6 mm long, lanceolate; calyx about 2 mm long; corolla tube 7.5–13 mm long, slender, pubescent, lobes 4, rounded. Fruit (drupe) 5 mm in diameter, shining, greenish, turning purplish-black or black when ripe, containing 2-celled nutlets. Flowers and fruits almost throughout the year, depending on locality; in central India flowering occurs mainly between September and January, and fruiting between October and February.

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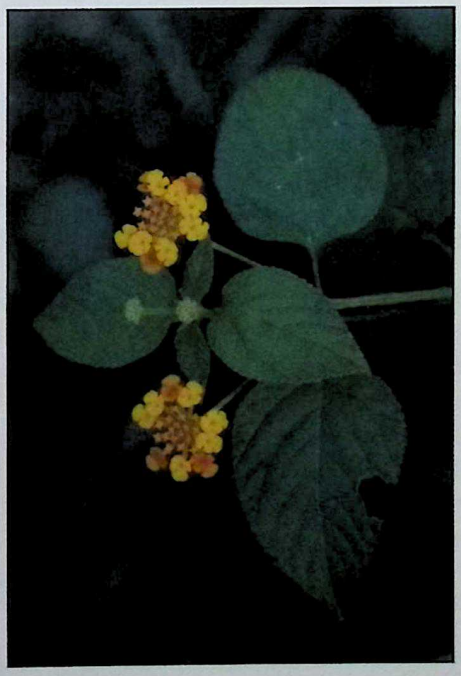
Distribution and habitat

Probably native to the Caribbean islands, now widely distributed and naturalized in nearly all tropical and subtropical regions of the world. Introduced to India as an ornamental and hedge plant, it is now naturalized almost throughout the country in areas receiving from 75 to over 500 cm annual rainfall on a variety of soil types. Due to its prolific growth, wide adaptability and tolerance of disturbed site conditions, the species is often considered a serious, invasive pest.

Medicinal properties and uses

The plant is considered antiseptic, antispasmodic, carminative and diaphoretic. In Ayurvedic practice the leaves are used to treat haemorrhage and diarrhoea. The pounded leaves are applied to relieve cuts, ulcers and swellings; a decoction of the leaves and fruits is used as a lotion to promote healing of wounds. An infusion of the leaves is taken internally to treat bilious fevers and catarrhal conditions, and is used externally in the form of a lotion or fomentation for eczema and rheumatism. In northeastern Karnataka the leaf extract is reportedly used to treat tuberculosis and fever in children, and smelling the flowers is considered useful for overcoming giddiness. An infusion of the flowers is given to children as a pectoral. In the Philippines, a decoction of the fresh roots is used as a gargle to relieve toothache. The ripe fruits are edible.



References

Chatterjee and Pakrashi (1995), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Girach and Aminuddin (1995), Kirtikar *et al.* (1935), Seetharam *et al.* (1999), Yoganarasimhan (1996).

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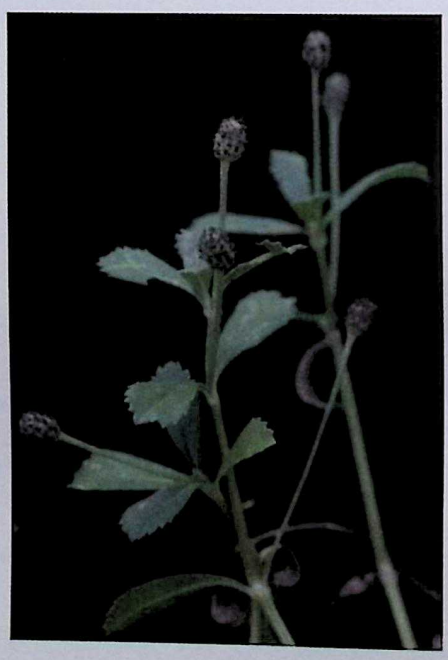
Phyla nodiflora (L.) Greene



Botanical synonyms

Lippia nodiflora (L.) A. Rich., *Verbena nodiflora* L.

Common names

Bengali: bhuiokra; ***Gujarati***: ratoliya, ratveliyo, ratuliyo; ***Hindi***: bhuiokra, jalapapili, lundra; ***Kannada***: nela hippali; ***Malayalam***: kattuttippali; ***Marathi***: jalapimpali, ratoliya; ***Oriya***: bukkan; ***Punjabi***: bakan, bhuiokra, bukan, mokna; ***Sanskrit***: jalapippali, vachira, vashira; ***Tamil***: podutalei, poduthalai; ***Telegu***: bokenaku, bokkena, nelaguridi.

Description

A creeping annual herb, often rooting at the nodes, with numerous subquadrangular branches. Leaves opposite, subsessile, 2–3.2 cm long and 1–2 cm wide, spathulate or obovate, base cuneate, apex rounded, margins sharply serrate near the apex, appressedly hairy on both sides with white hairs. Flowers sessile, densely packed in long pedunculate axillary heads that are at first globose, becoming elongate and spicate in fruit; peduncles 2.5–7.5 cm long; bracts 2.5 mm long, elliptic or obovate, shortly acuminate; calyx 2 mm long, membranous, deeply 2-lobed, closely enclosing the fruit with 2 acuminate lobes projecting beyond it; corolla 2.5–3 mm long, white or pale pink, 2-lipped. Fruits globose-oblong, 1.5–2 mm in diameter, dry, splitting into two 1-seeded glabrous convex pyrenes. Flowers and fruits almost throughout the year, but mainly between September and December.

Distribution and habitat

A common weed found in most tropical and subtropical countries. In India it is found in wet habitats such as rice fields and along irrigation channels, canals and riverbanks almost throughout the country to an altitude of 900 m.

Medicinal properties and uses

In Ayurveda, the plant is considered cooling, aphrodisiac, astringent to the bowels, stomachic, vulnerary, anthelmintic and alexiteric; it is used to treat diseases of the heart, blood and eye, asthma, bronchitis,

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thirst, loss of consciousness, and to promote healing of ulcers and wounds. In Unani, it is considered diuretic and maturant, and used to treat fevers and colds. It is also used to treat constipation, knee-joint pains and ischury. A paste or poultice prepared from the fresh plant is used as a suppurant or maturant to heal boils, swollen cervical glands, erysipelas and chronic indolent ulcers. An astringent, bitter infusion prepared from the leaves and tender stalks is given to children to relieve indigestion and to women following childbirth. The crushed leaves are applied externally to the forehead to relieve headache among the Rabaris in the Barda Hills of Gujarat. The leaves, ground with garlic, are used to relieve toothache among the tribal inhabitants of southern Andhra Pradesh.

References

Chatterjee and Pakrashi (1995), CSIR (1948–1992), Jadeja (1999), Kirtikar *et al.* (1935), Rao *et al.* (1996), Yoganarasimhan (1996).

Stachytarpheta jamaicensis (L.) Vahl var. *indica* L.

Botanical synonyms

Stachytarpheta indica (L.) Vahl, *Verbena jamaicensis* L.

Common names

English: Aaron's rod, Jamaica false vervain; ***Hindi***: kariyartharani; ***Kannada***: kadu uttarani, kariyuttarani, uttirani; ***Malayalam***: katapunuttu, kattapunuthu; ***Oriya***: jalajali; ***Tamil***: naioringi, simainaivirunji, simainayuruvi.

Description

An erect, glabrous, dichotomously branched annual or perennial herb, usually 30–90 cm high; young branches nearly quadrangular. Leaves oblong-elliptic, 5–10 cm long and 2.5–3.8 cm wide, apex acute or obtuse, margins coarsely serrate, base tapering and decurrent into the obscure petioles. Flowers sessile, borne in long, slender, nearly continuous glabrous spikes up to 30 cm long, the rachis hollowed out beneath each flower; bracts 5 mm long, lanceolate-subulate; calyx 6 mm long, membranous, tubular, teeth 4, short, acute; corolla deep blue or purple, rarely white, tube 1 cm long, slightly curved, hairy inside. Fruits (capsules) pear-shaped, ribbed, 3–4 mm long, enclosed in the calyx, breaking into 2 oblong pyrenes; seeds black, flattened.

Distribution and habitat

Native to tropical America and naturalized in the Asian tropics. Found as a weed throughout most of India; occasionally cultivated.

Medicinal properties and uses

The herb is used for treating intestinal worms, venereal diseases, ulcers, erysipelas, dropsy and stomach ailments. A

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decoction of the plant is said to be used as an abortifacient; in Bihar, it is reportedly used to stop vomiting. The juice of the leaves is used to remove cataracts. The leaves are rubbed on sprains and bruises or used as a cataplasm for boils, and their decoction is used to treat ulceration of the nose. An infusion of the bark is used to relieve diarrhoea and dysentery. In Brazil the plant is used externally to treat purulent ulcers and internally for treating fevers and rheumatic inflammation.

References

Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

Stachytarpheta mutabilis (N. Jacq.) Vahl

Botanical synonyms

Cymburus mutabilis (Jacq.) Salisb., *Stachytarpheta elegans* Welw., *S. variabilis* Saunders, *Valerianoides mutabilis* (Jacq.) Kuntze, *Verbena imbricata* Sessé & Moç. ex Moldenke, *V. mutabilis* N. Jacq.

Common names

English: pink snakeweed.

Description

A shrub usually 1–2 m tall, mostly pubescent throughout. Leaves 6–15 cm long and 4–8 cm wide, ovate or oval-oblong, varying to oblong-lanceolate or subcordate-ovate, margins crenate or serrate, apex acute, base narrowed and decurrent into petiole, scabrous above and pubescent beneath. Flowers crimson fading to rose, borne on spikes 30–60 cm long. Fruits (capsules) cylindrical, *c.* 0.6 cm long.

Distribution and habitat

Native to tropical America and introduced into India as an ornamental. It has become naturalized in the hills of Maharashtra, Karnataka, Kerala and Tamilnadu.

Medicinal properties and uses

The plant is used for treatment of fistula, pustules and tumours. The leaves, pounded with lime, are applied to promote healing of swollen wounds and sores; the leaves are also reported to be an abortifacient. A decoction of the leaves along with those of *Aerva sanguinolenta* (*Amaranthaceae*) is taken in Java to relieve painful menstruation.

Reference

CSIR (1948–1992).

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Tectona grandis L. f.

Botanical synonyms

Jatus grandis (L. f.) Kuntze, *Tectona theka* Lour., *Theka grandis* (L. f.) Lam.

Common names

Bengali: segun; ***English***: teak; ***Gujarati***: saga, sagach; ***Hindi***: sagwan, sagon, sagun; ***Kannada***: jadi, sagwani, tadi, tega, tegada mara; ***Malayalam***: tekka, thekku; ***Marathi***: sag, saga, sagwan; ***Oriya***: singuru; ***Punjabi***: sagun, sagwan; ***Sanskrit***: saka, sakah; ***Tamil***: tekku, tekkumaram, thekku; ***Telegu***: adaviteeku, peddateeku, teeku, teku.

Description

A deciduous tree up to 50 m tall with a cylindrical bole, becoming fluted and buttressed with age, and a rounded crown; bark fibrous, light brown or grey, exfoliating in long, thin strips; branchlets characteristically quadrangular and channelled, stellately tomentose. Leaves opposite, broadly elliptical or obovate, 30–60 cm long and 15–30 cm wide, often much larger in seedlings, smaller on flowering branches and bract-like in the inflorescence, coriaceous, rough above and grey-tomentose beneath with minute, red to black, glandular dots, apex acute or acuminate, base usually cuneate. Flowers small, white, sweet-scented, numerous on short pedicels borne in terminal panicles 30–90 cm long with lanceolate bracts at the forks; bracts beneath calyx 2.5 cm long, linear-lanceolate; calyx in flower 3 mm long, stellately tomentose, campanulate, lobes 5–6, 1.2 mm long, enlarged in fruit to 2.5 cm, ovoid, more or less crumpled, veined; corolla white, glabrous, 5–6-lobed, limb 6 mm across when expanded with spreading subequal lobes. Fruits hard, bony, irregularly globose, somewhat pointed at the apex, 1–1.5 cm in diameter, 4-celled, enveloped by the light brown, bladder-like calyx; seeds 1–3, marble-white, ovate, 0.4–0.8 cm long. Flowering season variable with locality, generally from June to September; fruits ripen from November to January.

Distribution and habitat

Teak grows naturally in dry and moist deciduous forests from the southern extension of the Aravalli range in Rajasthan to southern Uttar Pradesh, through Madhya Pradesh to Orissa and southwards through peninsular India. Its native range also includes Myanmar (Burma), Thailand, Laos, peninsular Malaysia, Sumatra and Java. In India it is particularly common in the mixed deciduous forests of Madhya Pradesh, Maharashtra and Karnataka, where it may form pure stands on some

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alluvial deposits. Its best growth occurs in the warmer and moister parts of its natural range receiving 125–250 cm of rainfall annually with a dry season of 3–5 months on fertile, well-drained soils. It is an important plantation species in India and in many other tropical countries, where it is valued for its rapid growth and high-quality timber.

Medicinal properties and uses

A paste prepared from the powdered wood is considered astringent, diuretic, hepatic, stimulant, sedative and a local refrigerant. It is recommended for reducing inflammatory swellings and toothache; taken internally, it is said to be useful as a vermifuge and for dyspepsia with a burning sensation in the stomach. The wood ash is applied to swollen eyelids and is believed to improve vision. The oil obtained by distillation of the wood is used by tribal inhabitants of Bastar (southern Madhya Pradesh) to treat eczema and ringworm. In some areas, the wood oil is mixed with the pounded seeds of *Derris oblonga* (*Fabaceae*) and used as an ointment to relieve itches. The bark is considered to be astringent and is used to treat bronchitis. The oil extracted from the seeds (nuts) is used to promote hair growth and to relieve scabies and itches. The flowers and seeds are diuretic and useful for treating bronchitis and biliousness. Among the Sahariyas of northwestern Madhya Pradesh, it is believed that the roasted seeds, taken by women during the month of March, will act as a contraceptive for one year. In Ayurvedic practice, the roots are used as a diuretic, and the flowers for treating bronchitis, biliousness and urinary discharges; the bark is considered sweet and acrid, and is used to treat bronchitis; the wood, regarded as cooling, acrid and laxative, is used as a uterine sedative during pregnancy and to treat biliousness, piles, leucoderma and dysentery.

References

Chatterjee and Pakrashi (1995), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Sikarwar and Kaushik (1992), Yoganarasimhan (1996).

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Vitex altissima L. f.

Botanical synonyms

Vitex alata Heyne, *V. appendiculata* Willd., *V. latifolia* Wight ex Steud., *V. pubescens* Heyne ex Wall.

Common names

Kannada: balgay, bulgi, myrole, navulaadi; ***Malayalam***: mayila, mayilai; ***Marathi***: balage, banalgay; ***Oriya***: muria; ***Tamil***: maila, mailadi, mayilai, myladi; ***Telegu***: busi, nemiliadaga, nemiliadugu, nevali adugu, nowli eragu.

Description

A medium-sized tree usually up to 18 m tall with somewhat drooping branches, pubescent branchlets, and grey, scaly, fibrous bark. Leaves 3- or rarely 5-foliate, terminal leaflet largest; leaflets sessile, lanceolate, obovate or elliptic, apex blunt or acuminate, largest leaflet 15–20 cm long and *c.* 7.5 cm wide; petioles 5–10 cm long, angular or winged. Flowers numerous, small, white tinged with blue, borne in shortly paniculate or nearly sessile cymes arranged in large, lax, terminal panicles; calyx campanulate, tomentose, 3.8 mm long; corolla 2-lipped, tube pubescent, lower lobe long. Fruit (drupes) irregularly globose, 0.5–1.2 cm in diameter, bluish-black or purple when ripe, white-dotted, with a persistent, flattened calyx.

Distribution and habitat

Though most commonly found in southern India, this species occurs naturally over a wide area of the Asian tropics from India, Bangladesh and Sri Lanka through Indochina, Java and Sumatra to New Guinea. Common in evergreen and deciduous forests of the Western Ghats and in open, dry forests elsewhere in peninsular India.

Medicinal properties and uses

In Ayurvedic practice the fruits are used as a substitute for those of *Piper cubeba* (*Piperaceae*) for treating stomatitis, cardiac diseases, anorexia, blindness, leprosy, worm infestation, and as a digestive and carminative. In Southeast Asia the juice of

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the bark is used externally to relieve rheumatic swellings and chest pains.

References

Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935), Yoganarasimhan (1996).

Vitex negundo L.

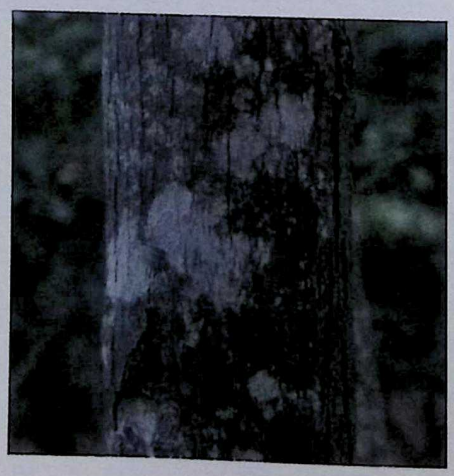
Botanical synonyms

Nika silvestris Hermann ex Moldenke, *Vitex paniculata* Lam., *V. spicata* Lour., *V. trifolia* Graham ex Chavan & Oza

Common names

Bengali: nirgundi, nishinda, samalu; ***English***: chaste tree, five-leaved chaste tree; ***Gujarati***: nagaol, nagoda; ***Hindi***: nasinda, nirgandi, sambhalu, shambalu, shivari; ***Kannada***: lakki gida, nakkilu, nekki, niragundi; ***Malayalam***: indrani, karinocchi, nocchi, vellanocchi, vennochi; ***Marathi***: nirgudi, nirgundi, nisind; ***Oriya***: begna, begundia, beyguna, nirgundi; ***Punjabi***: banna, marwan, shwari; ***Sanskrit***: nirgundi, sindhubara; ***Tamil***: nirkkundi, nocchi, nochi, vellainochi, vennochi; ***Telegu***: nallavavili, tellavaaviti, vaavili.

Description



A large, deciduous, aromatic shrub or small tree up to 4.5 m tall with quadrangular, densely whitish-tomentose branchlets; bark thin, grey. Leaves opposite, 3–5-foliate, common petioles 2.5–3.8 cm long; leaflets lanceolate, apex and base acute, terminal leaflet 5–10 cm by 1.6–3.2 cm with a petiolule 1–1.3 cm long, lateral leaflets smaller with a shorter petiolule, margins entire or rarely crenate, nearly glabrous above, white-tomentose beneath. Flowers pale blue or bluish-purple, borne in pedunculate grey-tomentose cymes forming large,

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pyramidal terminal panicles; bracts 1.5–2.5 mm long; calyx 3 mm long in flower, white-tomentose, teeth triangular, 0.8–1 mm long; corolla 1 cm long, tomentose outside, hairy inside at the insertion of the stamens, upper lip 2 mm long, divided at the base into 2 lobes, lower lip 5 mm long with 2 short oblong lateral lobes 1.5 mm deep and a large, broadly obovate crenulate terminal lobe 4 mm long. Fruits (drupes) ovoid, 0.5–1 cm long, black when ripe. In central India flowering occurs between June and December and fruiting from September to February.

Distribution and habitat

Native to a large portion of the Old World tropics from Mozambique, Madagascar and Zanzibar (Tanzania) to Iran, Pakistan and Afghanistan through South and Southeast Asia to Japan and Malesia. In India it is found throughout most of the country to an altitude of about 1500 m in the outer Himalayas. It often grows gregariously and is abundant on sandy soils in moist habitats such as river- and streambanks and in open, degraded sites. It is occasionally planted as a hedge.

Medicinal properties and uses

One of the most commonly used plants in traditional Indian medicine, all parts are used, although the leaves and roots, which have tranquillizing effects, are more highly valued as constituents of Ayurvedic preparations such as *Vishagarbha thaila*, widely used to treat rheumatism. The juice obtained from the stem is taken orally with honey to relieve indigestion among the tribal inhabitants of northern Orissa. The fresh, aromatic leaves are reportedly useful for reducing swelling of joints due to acute rheumatism and to relieve sprains; their decoction is used as a bath to relieve body pains by the Irular in Tamilnadu. The leaf paste is applied on the body to relieve bodyache among the tribal inhabitants of southern Bihar and northeastern Madhya Pradesh. The Kondhs of southwestern Orissa prepare a decoction of the leaves with those of *Justicia adhatoda* (*Acanthaceae*) used internally to relieve body-aches. The dried leaves are considered tonic and vermifuge; they are sometimes smoked for relief of headache and catarrh. A decoction of the leaves, to which long-pepper (*Piper longum*: *Piperaceae*) is added, is used to treat catarrhal fever associated with dullness of hearing and heaviness of the head; the leaf decoction and its vapours are also used in baths to treat fevers, catarrh and rheumatism. The leaf juice is used to clean infected ulcers and an ointment made from the leaf juice is used as a hair tonic. The roots possess tonic, febrifugal, expectorant, anodyne and diuretic properties and are used to treat dyspepsia, colic, rheumatism and boils. The powdered root is prescribed as an anthelmintic and as a demulcent for dysentery; it is also used to treat piles. Among tribal women in Udaipur District (Rajasthan), the powdered young roots are taken with milk to restore fertility and to relieve menstrual disorders. A tincture prepared from the root bark is considered useful for rheumatism and irritable bladder. In Surguja District in northeastern Madhya Pradesh, a decoction of the stem bark is reportedly used to treat paralysis and tuberculosis. The flowers are astringent, cardiotonic and cooling; they are prescribed for fever, cholera, diarrhoea and liver ailments. The fruits, considered cephalic, emmenagogue and a nervine tonic, are prescribed to relieve watery eyes, headache and catarrh; when dried they are considered vermifuge. The fruits are also highly valued in traditional Chinese medicine. The seeds are considered cooling and are used to treat skin diseases and leprosy. The leaves are used as a mosquito repellent.

References

Aminuddin and Girach (1996), Chatterjee and Pakrashi (1995), Chopra *et al.* (1956), CSIR (1948–1992), Girach (1992), Girach and Aminuddin (1995), Katewa and Arora (1997), Kirtikar *et al.* (1935), Kumar and Jain (1998), Ragupathy and Mahadevan (1991), Sivarajan and Balachandran (1994), Yoganarasimhan (1996).

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Violaceae

Hybanthus enneaspermus (L.) F. Muell.

Botanical synonyms

Hybanthus suffruticosus (L.) Baill., *Ionodium enneaspermum* (L.) Vent., *I. heterophyllum* Vent., *I. suffruticosum* (L.) Roem, & Schult., *Viola enneasperma* L., *V. suffruticosa* L.

Common names

Bengali: nunbora; ***Hindi***: ratanpurus; ***Malayalam***: kalthamara, orelatharmara; ***Sanskrit***: charati, padmacarini; ***Tamil***: orilaitamarai, purusharatnam; ***Telegu***: nilakobari, purusharatanam, suriyakanti.

Description

A small perennial herb 15–30 cm tall with a woody base and numerous diffuse or ascending branches. Leaves subsessile, linear to oblanceolate, 4–5 cm long and 0.2–0.8 cm wide, margins entire or serrate; stipules gland-tipped, subulate. Flowers solitary, axillary, red or purple, pedicels 6–12 mm long, erect, slender; bracts small, above the middle of the pedicel; sepals 2.5 mm long, lanceolate, very acute, keeled; petals unequal, the upper 2 oblong, the lateral 2 falcate, the lowest much larger than the others with an orbicular or obovate limb with a long claw which is curved behind into a short spur. Fruit a small subglobose capsule *c.* 0.6 cm in diameter; seeds ovoid, longitudinally striate, yellowish-white, *c.* 1.5 mm long.

Distribution and habitat

Found throughout the Old World tropics and subtropics. In India it occurs from Uttar Pradesh to Bengal southwards to Tamilnadu and Kerala.

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Medicinal properties and uses

The whole plant is considered to possess tonic, diuretic and demulcent properties. The leaves and tender stalks are demulcent and are used as a decoction or electuary; with oil, they are used to prepare a cooling liniment for the head. The dried powdered leaves are used to treat asthma. The root is diuretic and administered as an infusion to treat gonorrhoea and urinary infections; it is also used to treat bowel complaints in children among the Santhalis. The fruit is reportedly used in combination with other plant drugs to treat scorpion stings.

References

Asolkar *et al.* (1992), Chatterjee and Pakrashi (1992), Chopra *et al.* (1956), CSIR (1948–1992), Kirtikar *et al.* (1935).

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Vitaceae

Ampelocissus latifolia (Roxb.) Planch.

Botanical synonyms

Vitis latifolia Roxb., *V. montana* Lawson

Common names

Bengali: govila; ***English***: jungle angoor, jungle grave vine; ***Gujarati***: junglidrakh; ***Hindi***: dokarbel, panibel; ***Kannada***: kaadu drakshi; ***Malayalam***: karantavalli, valiyapirappitikha; ***Marathi***: golinda; ***Oriya***: dibroli, kanjianoi; ***Sanskrit***: amlavetasah, amrtasrava, ghanavalli, paniyavalli, sitalata, toyavalli, vrksaruha; ***Tamil***: kattukkodimundirigai; ***Telegu***: bedasativva.

Description

An extensive, scarcely woody, glabrous climber with slender, hollow stems 3–6 m long and 7.5–12 mm diameter; bark smooth, green, often tinged purple, especially at the nodes, covered with a thin glaucous bloom; tendrils forked. Leaves simple, glossy, orbicular, 3–7-angled or -lobed, 12.5–25 cm across, margins crenate-dentate, base 5–7-nerved; petioles variable in length up to 20 cm, deeply grooved above. Flowers 2.5 mm in diameter, reddish-brown, borne in pyramidal, panicled, pubescent cymes on a very stout peduncle together with a forked tendril; petals recurved, glabrous on both surfaces; stamens bright yellow. Berries globose, 7.5–9 mm in diameter, black, succulent, 2-seeded. In central India flowering occurs mainly in July and August and fruiting from September to November

Distribution and habitat

Found throughout most of India, to an altitude of *c.* 1200 m in the sub-Himalayan hills and Western Ghats, typically in hedges.

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Medicinal properties and uses

The juice of the tender leaves is used to relieve dental troubles, and as a detergent for indolent ulcers. The roots are astringent, and their decoction is taken to treat chronic dysentery; the crushed roots are applied to promote healing of wounds. The Santhalis of Bihar use this plant to relieve muscular pains, sores and to promote healing of broken bones. In Kerala, this plant is one of four *Vitaceae* species used as the source the Ayurvedic drug *Amlavesasah*, used to treat indigestion, liver and spleen diseases, and respiratory disorders, the other three species being *Cayratia trifolia*, *Cissus repens* and *C. vitiginea*; it is an ingredient of a number of compound Ayurvedic preparations.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956), CSIR (1948–1992), Sivarajan and Balachandran (1994), Yoganarasimhan (1996).

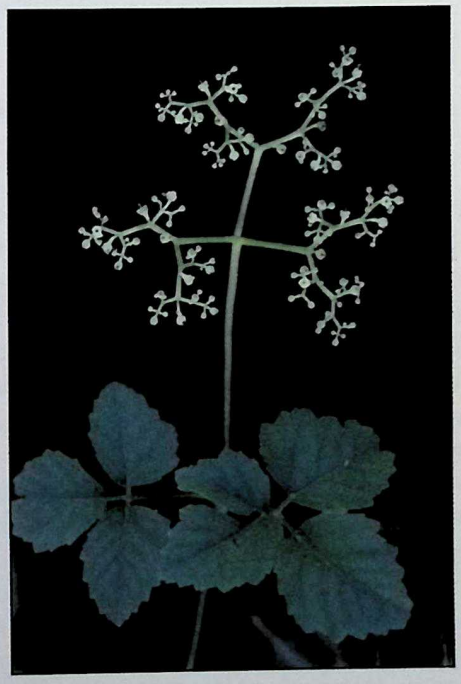
Cayratia trifolia (L.) Domin.

Botanical synonyms

Vitis carnosa (Roxb.) Wall., *V. trifolia* L.

Common names

Bengali: amallata, bundal; ***English***: fox grape; ***Gujarati***: khat, khatumdu, tamanya; ***Hindi***: amalbel, gidardrak, kassar, ramchana; ***Kannada***: heggoli; ***Malayalam***: sorivalli; ***Marathi***: amlatvel, kadamadavalli, odi; ***Oriya***: molobhanganoi; ***Punjabi***: amalbel, drukri, gidardak, karik, vallur; ***Sanskrit***: amlaparni, atyamlaparni; ***Tamil***: kurudinna, tumans; ***Telegu***: kamputige, kurudinne, mandulamaritige, pulimada; ***Urdu***: amalabel.



Description

A perennial climber with stems up to 7 m long and 4.5 cm in diameter; stems woody at the base only. Leaves alternate, trifoliate, common petioles 2–4.5 cm long; tendrils slender, leaf-opposed; leaflets thick, generally 3.8–5.7 cm long and 2.2–3.2 cm wide, the terminal one the largest, ovate-lanceolate to obovate or rotund-ovate, apex acute, mucronate, base rounded, obtuse or acute, margins crenate to serrate, more or less pubescent on both surfaces; main nerves 5–6 pairs; petiolules of lateral leaflets 2–6 mm long, those of the terminal leaflets twice as long. Flowers borne in branched, divaricate, pubescent, long-peduncled axillary or terminal cymes to 8 cm long and broad; calyx pubescent outside, funnel-shaped, truncately or obscurely 4-lobed; petals 4, oblong, rounded at apex, 2.5 mm long, hooded, pubescent outside. Fruits (berries) white, globose or turbinate, fleshy, 1.2–2 cm long, 2–4-seeded; seeds triangular, rounded and rugose on the back, cuneate on the face.

Distribution and habitat

Native to the Asian tropics from India and Sri Lanka to southern China, Indochina and Malesia. Common in open habitats

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throughout the hotter parts of India, including all of peninsular India up to 600 m elevation.

Medicinal properties and uses

The astringent roots are ground with black pepper and applied to boils. In Ayurveda they are used to treat tumours, pains and spleen complaints. Ground to a fine paste, they are applied to reduce lymphatic swellings by the Kolams of Andhra Pradesh. A fomentation prepared with a hot decoction of leaves or roots is considered diaphoretic and recommended for treatment of high fevers. The leaves, applied as a poultice, are rubefacient, and used to relieve yoke sores of bullocks.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956), CSIR (1948–1992), Joshi (1989), Kirtikar *et al.* (1935), Ravisankar and Henry (1992), Sivarajan and Balachandran (1994), Yoganarasimhan (1996).

Cissus quadrangularis L.

Botanical synonyms

Cissus edulis Dalz., *Vitis quadrangularis* (L.) Wight

Common names

Bengali: harbhanga, hasjora, horjora; ***English***: bone setter, edible-stemmed vine; ***Gujarati***: chodhari, hadsand, hadsankal, vedhari; ***Hindi***: hadjora, harsankari; ***Kannada***: mangaravalli, mangaroli, sanduballi; ***Malayalam***: cannalamparanta, changalamparanda, changalaparanta, piranta, sannalampiranta; ***Marathi***: chaudhari, hursanher, kandavela, kandvela, tridhari; ***Oriya***: hadabhanga, hadobanda, hadojoda, harbhanga; ***Sanskrit***: asthisanhari, vajravalli; ***Tamil***: arugani, indiravalli, pirandai, uchiradam, vachiravalli; ***Telegu***: nalleru, vajravalli; ***Urdu***: harjora.

Description

A succulent, glabrous, deciduous climber up to 8 m long; stems thick, quadrangular, 4-winged (when young), dichotomously branched, restricted at the nodes, leafless when old; tendrils long, slender, simple. Leaves simple, alternate, thick-coriaceous, broadly ovate or reniform, sometimes 3–7-lobed, smooth on both surfaces, 2.5–7.5 cm long and 3–9 cm wide, apex rounded, base cuneate or truncate, margins crenate-serrate; petioles 6–12 mm long; stipules small, broadly ovate; tendrils simple, leaf-opposed. Flowers small, greenish-white, borne in shortly pedunculate, leaf-opposed cymes with spreading umbellate branches; calyx cup-shaped, truncate or obscurely lobed; petals 4, ovate-oblong, acute, 3 mm long, hooded at apex. Fruit (berry) globose or obovoid, succulent, 0.6–0.7 cm in diameter, apiculate, very acrid, red when ripe, usually 1-seeded. Flowers from July to September, fruits from November to January.

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Distribution and habitat

Widely distributed in the Old World tropics from East Africa and the Arabian peninsula to the Indian subcontinent, mainland Southeast Asia, the Philippines and Java. It is found throughout India, most commonly in drier regions of peninsular India, extending west to the eastern slopes of the Western Ghats to southern Kerala; commonly cultivated in gardens throughout the country.

Medicinal properties and uses

In Ayurveda, the plant is considered alterative, carminative, anthelmintic, aphrodisiac and stomachic; it is used in the treatment of gastrointestinal disorders, irregular menstruation, dyspepsia, indigestion, piles, worms, asthma, gout, syphilis, venereal diseases, leucorrhoea and anorexia. A paste of the fresh stem, applied externally (and sometimes given internally), is widely used in traditional Indian medicine to promote healing of bone fractures. It is also used to relieve burns, wounds and the bites of poisonous insects. In Siddha the whole plant and root are used to treat piles, abdominal disorders, diarrhoea and dysentery. The juice from the stem is prescribed as an alterative in the treatment of scurvy, irregular menstruation, nosebleeds, and in diseases of the ear. The leaves and young shoots have alterative and stomachic properties and are used in powdered form to treat indigestion. A decoction of the shoots with dry ginger and black pepper is given to relieve body pains. Among the Asur tribal inhabitants of Chota Nagpur and Bihar, the stem and leaves, pounded in water, are given to women to relieve pain after childbirth. An extract of the plant exhibits cardiotonic and androgenic properties. The young stem is edible, sometimes made into curries and chutneys. The ash of the plant is used as a substitute for baking powder. The herb is fed to cattle to induce flow of milk.

References

Asolkar *et al.* (1992), Bhatt *et al.* (1999), Chopra *et al.* (1956, 1969), CSIR (1948–1992), Girach (1992), Kirtikar *et al.* (1935), Kumbhojkar *et al.* (1991), Sivarajan and Balachandran (1994), Yoganarasimhan (1996).

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Zingiberaceae

Curcuma longa L.

Botanical synonym

Curcuma domestica (Medik.) Vahl.

Common names

Bengali: haldi, pitras; ***English***: turmeric; ***Gujarati***: halada; ***Hindi***: haldi, hardi, huldi, otkondro; ***Kannada***: arishina, arisina; ***Konkani***: halad, ollod, ollodi; ***Malayalam***: mannal, marinalu; ***Marathi***: halde, halede; ***Punjabi***: haldar, halja; ***Sanskrit***: haridra; ***Tamil***: manjal; ***Telegu***: pampi, pasupu; ***Urdu***: haladi.

Description

A tall herb; rootstock large, ovoid, with cylindrical tubers that are bright yellow or orange inside. Leaves very large, in tufts up to 1.2 m long including petioles, blade up to 50 cm long and 8 cm wide, oblong lanceolate, tapering to the base; petiole about as long as leaf blade. Flowers pale yellow, borne in spikes 10–15 cm long, appearing with the leaves in the middle of the leaf tufts; peduncle 15 cm long, hidden in sheathing petiole; flowering bracts pale green; bracts of coma white and green, tinged with pink.

Distribution and habitat

Cultivated extensively in the tropics, including throughout India up to 1500 m elevation, especially in Punjab, West Bengal, Maharashtra, Karnataka, Tamilnadu and Kerala. The plant is believed to be indigenous to Bihar.

Medicinal properties and uses

The dried, powdered rhizome is the source of *turmeric*, widely used in Indian cuisine as well as in traditional medicine. Turmeric is considered to have strong antiseptic properties and is used to treat poiso-

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nous affections, ulcers and wounds. In Ayurveda, is considered to be alterative, antiperiodic, germicidal, carminative, stimulant, tonic and vermifuge. It is used to treat diabetes, eye diseases, ulcers, oedema, anaemia, anorexia, leprosy, scrofula; its paste, sometimes combined with that of neem leaves (*Azadirachta indica*: *Meliaceae*), is used to cure ringworm, itching, eczema and other parasitic skin diseases, and in the treatment of chickenpox and smallpox. In Unani medicine it is considered carminative, maturant and diuretic and useful for treating jaundice and other liver disorders, urinary discharges, scabies and bruises. It is applied externally to relieve wounds, sprains and bruises, and to improve skin complexion and resolve pimples; it is used internally for treatment of blood disorders. The fresh juice of the rhizome is said to be useful as an anthelmintic, and a decoction of the rhizomes is applied externally to relieve cold symptoms, purulent ophthalmia and conjunctivitis. An essential oil obtained from the rhizome is used as a carminative, stomachic and tonic. A paste made of the flowers is used externally to treat ringworm and other parasitic skin diseases, as well as gonorrhoea. In Bihar, the flower is reportedly used as an antifertility agent, and the leaf for treating cold, fever and pneumonia.

References

Asolkar *et al.* (1992), Chopra *et al.* (1956, 1969), Jain (1995), Kirtikar *et al.* (1935), Sivarajan and Balachandran (1994), Yoganarasimhan (1996).

Hedychium coronarium Koenig

Botanical synonym

Hedychium flavum Roxb.

Common names

English: common ginger lily, garland flower; ***Oriya***: dhunsuli.

Description

A stout perennial herb, usually 1–2 m tall; rootstock stout, horizontal, fleshy, jointed, 2.5–5 cm thick bearing leafy shoots. Leaves large, with long, clasping sheaths, distichous, oblong-lanceolate, apex acuminate, base attenuate, glabrous above and glabrous or sparsely pubescent beneath and on the midrib; sheath smooth; ligule 1.8–3.2 cm long, membranous. Flowers white, showy, fragrant, borne in dense oblong spikes 10–20 cm long; bracts closely imbricate, ovate, obtuse, at first green then turning brown, each subtending 3–6 flowers; bracteoles 3, membranous; calyx 2.5–3.8 cm long, cylindrical, green, shorter than the bracts; corolla tube *c.* 7.6 cm long, segments linear, half as long as the tube, reflexed. Fruits (capsules) oblong, glabrous, yellow inside; seeds many, with a crimson aril.

Distribution and habitat

Widely distributed in moist tropical and subtropical regions of Asia from India east-

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wards to Malesia. Commonly grown in gardens as an ornamental throughout India and elsewhere in the tropics.

Medicinal properties and uses

The ground rhizome is used as a febrifuge by the Mundas or Ranchi district in Bihar. A decoction of the rhizome is considered anti-rheumatic, tonic and excitant. The juice from the base of the stems is reportedly used externally to relieve swellings; among the Gadabas, Khonds and Porjas in the Eastern Ghats of Andhra Pradesh, the rhizome and leaf paste are applied to the forehead to relieve headache and to the body to treat swellings. The juice obtained from the crushed roots, warmed with water and filtered, is used as an eyewash to relieve redness, swollen eye, pain, and excessive excretions among the Baigas of northeastern Madhya Pradesh. Among the tribal inhabitants of Orissa, a paste made from the crushed flowers and black pepper are taken orally for dysuria. In Ayurveda, the rhizome is used as a substitute for that of *Hedychium spicatum* for treating dyspnoea, oedema, wounds and distaste. The stems are a useful raw material for paper-making; the flowers are used for making perfume in Hawaii.

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Zygophyllaceae

Tribulus terrestris L.

Botanical synonym

Tribulus languinosus L.

Common names

Bengali: gokhru, gokhuru; ***English***: land caltrops, puncture-vine; ***Gujarati***: betagokhru, bethu, gokharu, mithagokhru, nahanagokhru; ***Hindi***: chotagokhru, gokhru; ***Kannada***: negalu, negilmullu, sanna neggila; ***Konkani***: negilmullu; ***Mayalalam***: nerinjil, nerinnil, nerinjeekai (fruits), nerungil; ***Marathi***: ghokaru, lahangokharu, sarala, sharatte; ***Oriya***: gakhura, gokshra; ***Punjabi***: bakhra, bhukri, gokhrudesi, lotak; ***Sanskrit***: gokshura, goksura, goksurah, ikshugandha, svadamstra, trikantaka; ***Tamil***: nerinjeekai (fruits), nerunji, sirunerinji; ***Telegu***: chinnipalleru, chirupalleru, pallerukayalu (fruits); ***Urdu***: gokharu.

Description

A more or less pubescent annual herb with prostrate or decumbent primary branches up to 1.5 m long radiating from the crown of the taproot; roots slender, cylindrical, somewhat fibrous, 10–15 cm long, light brown and faintly aromatic. Leaves opposite, paripinnate, up to 5.5 cm long, one of each pair usually smaller than the other; leaflets 3–6 pairs, 6–12 mm long, oblong to linear-oblong, with silky hairs on both surfaces, apex mucronate, base rounded oblique; petiolules very short. Flowers pale-yellow to yellow, 0.7–2 cm in diameter, leaf-opposed, solitary; pedicels 1.2–2 cm long, slender, hairy; sepals 6 mm long, lanceolate, acute; petals 1 cm long, oblong-obovate, claw short, hairy. Fruits globose, consisting of 5–12 woody cocci, each with 2 pairs of hard, sharp, divaricate spines, one pair longer than the other; seeds

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several in each coccus with transverse partitions between them. Flowers and fruits throughout the year.

Distribution and habitat

Native to the Mediterranean region; introduced and naturalized nearly throughout the tropics, subtropics and warm temperate regions of the world. It is a common weed found throughout India, particularly in drier regions on sandy soils, to an altitude of approximately 5400 m in Kashmir.

Medicinal properties and uses

The fruits are credited with diuretic, cooling, demulcent, tonic and aphrodisiac properties.They are used in Ayurveda to treat kidney stones, painful urination and other genito-urinary disorders, usually in the form of an infusion; they are also prescribed in the treatment of diabetes, piles, rheumatism, dropsy, breathing difficulties, heart disease, impotence and Bright's disease. The leaves are considered to possess stomachic properties, and a paste prepared from them is used to treat bladder stones. The root is considered to have aperient and tonic properties, and is a constituent of the the Ayurvedic drugs *Dasamula* and *Amritha prasa ghritha*; the fruits are used in a number of important compound Ayurvedic preparations.

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Glossary of Medical Terms

Abdominal	Relating to the abdomen
Abortifacient	Inducing abortion
Abscess	A localized collection of pus surrounded by inflamed tissue
Acne	A disorder of the skin caused by inflammation of the skin glands and hair follicles marked by pimples, especially on the face
Acro-narcotic	A substance possessing both acrid and narcotic properties
Adulterant	A substance used to replace a more valuable agent or ingredient
Ague	A fever marked by paroxysms of chills, fever and sweating that occur at regular intervals
Alexipharmic	A drug used to neutralize a poison; antidote; antipharmic
Alexiteric	Capable of warding off contagion; an antidote for poison, especially an external application
Alimentary	Relating to nourishment or nutrition
Alopecia	Hair loss; baldness
Alterative	A drug used to alter favourably the course of an ailment and to reestablish normal organ function
Amenorrhoea	Abnormal absence or suppression of the menstrual discharge
Amoebiasis	Infection with or disease caused by amoebas
Anaemia	A condition in which the blood is deficient in red blood cells, haemoglobin, or in total volume
Anaesthetic	An agent that produces partial or total loss of sensation with or without loss of consciousness
Analgesic	A drug that relieves or reduces pain
Anasarca	Oedema with accumulation of serum in the connective tissue
Androgenic	Pertaining to androgen, a male sex hormone
Anodyne	An agent that relieves pain, soothes, calms or comforts
Anorexia	Loss of appetite, especially when prolonged
Anthelmintic	An agent that destroys or expels parasitic worms, especially of the intestines; vermifuge
Antiallergic	Countering allergic reactions
Antibacterial	Directed or effective against bacteria
Antibilious	An agent that relieves bilious conditions
Antibiotic	A substance that inhibits or kills microorganisms
Antidote	An agent used to counteract the action or effect of poisons
Antidysenteric	An agent used to counteract dysentery and its symptoms
Anti-emetic	An agent that prevents or lessens the tendency to vomit
Antifertility	Able to or tending to reduce or destroy fertility or conception
Antifungal	Used or effective against fungi
Antiherpetic	Used or effective against herpes virus

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Anti-inflammatory	Counteracting inflammation
Antilithic	An agent preventing the formation of a (urinary or kidney) stone or calculus
Antiperiodic	An agent used to treat periodic disorders or diseases (e.g. malaria)
Antiphlogistic	Counteracting inflammation
Antipruritic	Relieving itching
Antipyretic	An agent that reduces fever
Antirheumatic	An agent relieving or curing rheumatism
Antiscorbutic	A drug used to cure scurvy
Antiseptic	An agent used to arrest growth or action of bacteria and other microorganisms causing infection
Antisoporific	Increasing alertness or awareness
Antispasmodic	Allaying, relaxing or controlling spasms
Antitubercular	Used or effective against tuberculosis
Antiviral	Acting to make virus ineffective
Anuria	Absence of or defective excretion of urine
Aperient	Gently moving the bowels; laxative
Aphrodisiac	Exciting sexual desire
Aphtha (*pl.* aphthae)	A boil arising from the mucous membrane, usually in the mouth
Appetizer	An agent that stimulates appetite
Aromatic	A substance with a fragrant, cordial, spicy taste and/or odour and containing volatile oils and stimulants to the gastro-intestinal mucous membrane
Arthralgia	Neuralgic pain in one or more joints
Arthritis	Inflammation of joints due to infectious, metabolic or constitutional causes
Ascariasis	Infestation with or disease caused by ascarids
Ascaris	A genus of parasitic worms infesting the small intestine
Ascites	Abnormal accumulation of serous fluid in the peritoneal cavity of the abdomen
Asthma	A lung disease characterized by wheezing, difficult breathing, coughing and a feeling of suffocation
Astringent	An agent that produces condensation or contraction of organic tissue, muscular fibre, or arresting haemorrhages, or lessening secretions of the mucous membrane, such as those of the stomach
Atonic	Characterized by lack of physiological tone, especially of a contractile organ
Atrophy	Wasting or emaciation with loss of strength
Attenuant	An agent that increases the fluidity or thinness of the blood or other secretion
Beri-beri	A deficiency disease marked by inflammatory or degenerative changes of the nerves, digestive system and heart caused by a lack of or inability to assimilate thiamine
Biliousness	A condition due to disordered liver function and excessive excretion of bile, characterized by indigestion, constipation and headache
Blackwater fever	Any of several diseases characterized by dark-coloured urine
Blennorrhoea	An excessive secretion and discharge of mucus
Blood purifier	Agent believed to remove impurities or deficiencies from blood
Boil	A localized swelling and inflammation of the skin resulting from infection in a skin gland, having a hard central core, and forming pus
Bright's disease	Any of several kidney diseases marked by albumin in the urine
Bronchial	Of or relating to the bronchi or their ramifications in the lungs
Bronchitis	Acute or chronic inflammation of the bronchial tubes
Cachectic	Affected by cachexia
Cachexia (cachexy)	General physical wasting and malnutrition usually associated with chronic disease
Calculus (*pl.* calculi)	Concretion usually of mineral salts around organic material found especially in hollow organs or ducts, such as the bladder

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Cancer	A malignant tumour of potentially unlimited growth that expands locally by invasion and systematically by metastasis
Carbuncle	A painful local purulent inflammation of the skin and deeper tissues with multiple openings for the discharge of pus and, usually, necrosis and sloughing of dead tissue
Carcinogenic	A substance or agent producing or inducing cancer
Carcinoma	A malignant tumour of epithelial origin
Cardiac	Relating to the heart
Cardialgia	Heartburn; pain in the heart
Cardiotonic	An agent tending to increase the tonus of heart muscle
Caries	Tooth decay
Carminative	Expelling gas from the alimentary canal so as to relieve colic or griping
Cataplasm	Plaster; poultice
Cataract	A clouding of the lens of the eye or of its capsule obstructing the passage of light
Catarrh	Inflammation of a mucous membrane, usually of the nose and respiratory system
Cathartic	Purgative
Cholera	An acute infectious disease caused by *Vibrio*, resulting in diarrhoea, vomiting, cramps and suppression of urine
Cholagogue	A drug that stimulates the action of the liver, empties the gallbladder, promotes secretion or excretion of bile and produces free purgation at the same time
Chorea	A nervous disorder marked by spasmodic movements of limbs and facial muscles and by incoordination
Chronic	Marked by long duration or frequent recurrence
Cirrhosis	Fibrosis, especially of the liver, with hardening caused by excessive formation of connective tissue followed by contraction
Coagulation	Becoming viscous or thickened into a coherent mass
Colic	A paroxysm of acute abdominal pain localized in a hollow organ and caused by spasm, obstruction or twisting
Collyrium	An eye lotion or eyewash
Coma	A state of profound unconsciousness caused by disease, injury or poison
Conjunctivitis	Inflammation of conjunctiva (mucous membrane lining inner surface of eyelids)
Constipation	Abnormally delayed or infrequent passage or dry, hard faeces
Consumption	A progressive wasting away of the body, especially from pulmonary tuberculosis
Contusion	Injury to tissue caused by a blow, without causing a break in the skin
Convulsion	An abnormal, violent and involuntary contraction or series of contractions of the muscles; an uncontrolled fit
Cooling	Reducing temperature or thirst
Cordial	A stimulating medicine or drink
Corneal	Relating to the cornea
Corns	A local hardening and thickening of epidermis (as on a toe)
Corpulence	The state of being excessively fat
Coryza	An acute inflammatory contagious disease involving the upper respiratory tract; common cold
Counterirritant	An agent applied locally to produce superficial inflammation with the object of reducing inflammation in deeper adjacent structures
Courbature	Aching of the muscles
Cow-itch	Cowage; itching caused by the hairs of the pods of *Mucuna pruriens*
Cramp	Sudden painful involuntary contraction of muscles
Cutaneous	Of, relating to, or affecting the skin
Cystitis	Inflammation of the urinary bladder
Debility	Weakness, infirmity

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Decoction	An extract obtained by boiling down
Decongestant	An agent that relieves congestion of the mucous membranes
Defluxion	A flowing down of fluid, as a copious discharge from the nose in catarrh
Demulcent	A mucilaginous or oily substance capable of soothing or protecting an abraded mucous membrane
Dentifrice	A powder, paste or liquid for cleaning the teeth
Deobstruent	A drug that removes functional obstructions of the body
Depurative	A purifying agent
Dermatitis	Inflammation of the skin
Detergent	Purifying or cleansing
Diabetes	A metabolic disorder resulting in elevated blood glucose and discharge of large amounts of glucose-containing urine
Diabetes mellitus	A familial constitutional disorder of carbohydrate metabolism characterized by inadequate secretion or utilization of insulin, by polyuria and excessive amounts of sugar in the blood and urine, and by thirst, hunger and loss of weight
Diaphoretic	Having the power to increase perspiration
Diarrhoea	A common symptom of gastrointestinal diseases resulting in frequent discharge of watery stools
Diathesis	A constitutional predisposition towards an abnormality or disease
Digestive	Something that aids digestion, assisting the stomach and intestines in their normal functions
Diphtheria	An acute febrile contagious disease marked by the formation of a false membrane, especially in the throat, and caused by a bacterium which produces a toxin causing inflammation of the heart and nervous system
Disinfectant	An agent that frees from infection, destroying vegetative forms of harmful microorganisms
Distaste	Dislike of food or drink
Diuresis	An increased secretion of urine
Diuretic	An agent that induces or stimulates the flow of urine
Dropsy	Oedema
Dysentery	A disease characterized by severe diarrhoea with passage of mucus and blood, usually caused by bacterial or protozoan infection
Dysmenorrhoea	Painful menstruation
Dyspepsia	Indigestion
Dyspnoea	Difficult or laboured respiration
Dysuria	Difficult or painful urination
Ecbolic	Agents that produce abortion or facilitate parturition by contracting uterine muscles
Eczema	An inflammatory condition of the skin characterized by redness, itching, and oozing vesicular lesions which become scaly, crusted or hardened
Electuary	Confection
Elephantiasis	Enlargement and thickening of tissues, specifically the enormous enlargement of a limb or the scrotum caused by obstruction of lymphatics by filarial worms
Elixir	A sweetened liquid, usually containing alcohol, that is used as a vehicle for medicinal agents
Emaciation	Wasting away physically
Embrocation	Liniment
Emetic	Causing vomiting, or an agent that induces vomiting
Emmenagogue	An agent that promotes normal menstrual discharge
Emollient	A substance applied externally to soften or soothe the skin, or internally to soothe inflamed or irritated mucous membrane
Empyema	The presence of pus in a bodily cavity
Endometrium	The mucous membrane lining the uterus

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Enema	The injection of liquid into the intestine by way of the anus; the material used for an enema
Enteric	Of, relating to, or being a medicinal preparation treated to pass through the stomach unaltered and disintegrate in the intestines
Epididymitis	Inflammation of the epididymis, an elongated mass of convoluted efferent tubes at the back of the testis
Epilepsy	Any of various nervous disorders marked by disturbed electrical rhythms of the central nervous system and typically manifested by convulsive attacks, usually with clouding of consciousness
Epiphora	A watering of the eyes due to excessive secretion of tears or to obstruction of the lacrimal passages
Errhine	A drug that, applied to the mucous membrane of the nose, increases nasal secretions without causing sneezing
Eruption	The breaking out of a rash on the skin or mucous membrane
Erysipelas	An acute febrile disease associated with intense local inflammation of the skin and subcutaneous tissues caused by a haemolytic streptococcus
Erythema	Abnormal redness of the skin due to capillary congestion (as in inflammation)
Expectorant	Tending to promote discharge of mucus from the respiratory tract
Febrifuge	Antipyretic; an agent that reduces fever
Febrile	Of or relating to fevers
Fertility	Capability to conceive or cause conception
Fibroids	A benign tumour made up of fibrous muscular tissue that occurs especially in the uterine wall
Fibrositis	A rheumatic disorder of fibrous tissue
Filaria	Filamentous nematodes (of *Filaria* and related genera) that as adults are parasitic in the blood or tissues
Filariasis	A disease caused by infection with nematode worms, affecting chiefly the lymph glands and connective tissue
Fistula	An abnormal passage leading from an abcess or hollow organ to the body surface or from one hollow organ to another
Flatulence	Excessive gas in the stomach or intestines
Flux	A flowing of fluid from the body, usually referring to an excessive abnormal discharge from the bowels
Fomentation	Hot moist substances applied to the body to ease pain
Fumigatory	A drug taken by inhalation of its smoke after burning
Furunculosis	Multiple boils (or furuncles) on the skin
Galactagogue	An agent that stimulates secretion of milk
Gallstones	A calculus formed in the gallbladder or biliary passages
Gangrenous	Affected by gangrene, a massive necrosis of tissue
Gastralgia	Neuralgia of the stomach
Gastric	Relating to the stomach
Gastritis	Inflammation of the mucous membrane of the stomach
Gastroenteritis	Inflammation of the lining membrane of the stomach and intestines
Giddiness	Dizziness, causing instability and sometimes nausea and vomiting
Gingivitis	Inflammation of the gums
Glaucoma	A disease of the eye marked by increased pressure within the eyeball, damage to the optic disc, and gradual loss of vision
Gleet	A chronic inflammation of a bodily orifice, usually accompanied by an abnormal discharge
Glycosuria	The presence in the urine of abnormal amounts of sugar
Goitre	An enlargement of the thyroid gland visible as a swelling of the front of the neck
Gonorrhoea	A contagious inflammation of the genital mucous membrane caused by gonococcus
Gout	A metabolic disease marked by a painful inflammation of the joints. Deposits of urates in and around the joints, and usually an excessive amount of uric acid in the blood

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Gravel	Granular concretions formed in the kidneys
Gripe	Intermittent pains in the bowels, as if by sudden constriction
Guinea worm	A slender nematode worm (*Dracunculus medinensis*) attaining a length of more than a metre and occuring as an adult in the subcutaneous tissues of various mammals, including humans
Haematoma	A tumour or swelling containing blood
Haematuria	The presence of blood or blood cells in the urine
Haemoptysis	Expectoration of blood from some part of the respiratory tract
Haemorrhage	Copious discharge of blood from the blood vessels
Haemorrhoids	A mass of dilated veins in the swollen tissue situated near the anal sphincter; also known as piles
Haemostatic	An agent that arrests bleeding
Helminthiasis	Any disorder caused by infestation with parasitic worms
Hemicrania	Severe pain affecting one half side of the head
Hemiplegia	Paralysis of one side of the body
Hepatic	Relating to the liver
Hernia	Abnormal protrusion of an intestine or other organ through its containing wall, usually in the abdominal cavity
Herpes	An inflammatory eruption on the skin forming groups of small blisters that tend to spread
Hookworm	Any of several parasitic nematodes (family Ancylostomatidae) that have strong buccal hooks or plates for attaching to the host's intestinal lining and that include serious bloodsucking pests
Hydragogue	A drug which causes free secretion from the intestinal glands and removes much serum from the blood vessels, producing watery stools
Hydrocele	Pathological accumulation of serum fluid in a body cavity, usually in the testes
Hydrophobia	A condition characterized by dread of water with convulsions, resulting from the bite of a rabid animal
Hyperacidity	A condition characterized by more than the normal amount of acidity in the digestive tract
Hyperglycaemia	Excess of sugar in the blood
Hypertension	Abnormally high blood pressure and, especially, arterial blood pressure
Hypnotic	Tending to produce sleep; soporific
Hypochondriasis	Morbid concern about one's health, especially when accompanied by delusions of physical disease
Hypoglycaemia	Abnormal decrease in the level of sugar in the blood
Hypotension	Abnormally low blood pressure
Hypotensive	Causing low blood pressure or a lowering of blood pressure
Hysteria	A psychoneurosis marked by emotional excitability and disturbances of the psychic, sensory, vasomotor and visceral functions
Impetigo	An acute contagious skin disease characterized by vesicles, pustules and yellowish crusts
Impotence	Inability to engage in sexual intercourse, usually with reference to males
Indigestion	Inability to digest or difficulty in digestion
Indolent	Slow to develop or heal
Infertility	Inability to conceive or cause conception
Influenza	A contagious, infective, sometimes epidemic viral disease commonly characterized by inflammation of the upper air passages, fever, and nervous and muscular prostration
Infusion	A product obtained by steeping in liquid without boiling for extracting useful substances
Insecticidal	Lethal to insects
Insomnia	Sleeplessness
Intercostal	Situated between the ribs
Intermittent	Not continuous; coming and going at intervals

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Inveterate	Firmly established for a long period of time
Ischuria	Retention of urine
Jaundice	Yellowness of skin, tissues and secretions (such as urine) due to deposition of bile pigments in the blood
Lactagogue	An agent that stimulates secretion of milk; galactagogue
Laryngeal	Relating to the larynx
Laxative	Having a tendency to relieve constipation; a mild purgative
Leishmaniasis	Infection by parasitic protozoans of the genus *Leishmania*
Leprosy	A chronic, communicable disease caused by a bacillus (*Mycobacterium leprae*) and characterized by the formation of nodules or of macules that enlarge and spread, accompanied by loss of sensation with eventual paralysis, wasting of muscles, and production of deformities and mutilations
Leucoderma	A skin condition characterized by defective whitish pigmentation; a congenital absence of pigments in spots or bands
Leucorrhoea	A white or yellowish viscid discharge from the vagina resulting from inflammation or congestion of the mucous membrane
Leukaemia	An acute or chronic disease characterized by an abnormal increase in the number of leucocytes in the tissues and often the blood
Liniment	A liquid or semiliquid preparation that is applied to the skin as an anodyne or a counterirritant
Lipolytic	Causing the breakdown and decomposition of fat
Lithiasis	The formation of stony secretions in the body
Lithotripic	An agent thought to be effective in dissolving various concretions in the body, such as urinary calculi; antilithic
Lochia	The discharge from the vaginal passages during the 2–3 weeks after childbirth
Lochial	Relating to lochia
Lumbago	Painful muscular rheumatism involving the lumbar region of the back
Lupus	A chronic tuberculous skin disease producing watery nodules, generally around the nose
Lymphatic	Of, relating to, or produced by lymph, lymphoid tissue or lymphocytes
Malaria	An acute, usually chronic disease caused by sporozoan parasites (genus *Plasmodium*) in the red blood cells, transmitted by *Anopheles* mosquitoes, causing periodic attacks of chills and fever
Malignant	Life-threatening; opposite of benign
Mammary	Of or pertaining to a breast or mamma
Mania	Exaggerated melancholia alternating with an exaggerated sense of well-being, accompanied by excessive mental and physical activity
Masticatory	Substance chewed or sucked to increase salivation
Mastitis	Inflammation of the breast, usually caused by infection
Maturant	An agent that promotes growth or development of an ailment towards a final or desired state
Measles	An acute contagious viral disease marked by an eruption of distinct red circular spots
Melancholia	A mental condition characterized by extreme depression, bodily complaints, and often hallucinations and delusions
Melaena	The passage of dark, tarry stools containing decomposing blood that is usually an indication of bleeding in the upper part of the alimentary canal
Menorrhagia	Abnormally profuse menstrual flow
Menstrual complaints	Irregularity in the monthly discharge from the uterus; includes menorrhagia and dysmenorrhoea
Metritis	Inflammation of the womb
Migraine	A condition marked by recurrent severe headache often with nausea and vomiting
Mucous membrane	A membrane rich in mucous glands that lines body passages and cavities which communicate directly or indirectly with the exterior

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Mumps	An acute contagious viral disease marked by fever and inflammation of the parotid gland and consequent swelling of the neck and face
Myopathy	A disorder of muscle tissue or muscles
Narcotic	A drug that in moderate doses dulls the senses, relieves pain and induces profound sleep but in excessive doses causes stupor, coma or convulsions
Nausea	A stomach distress with distaste for food and an urge to vomit
Nephritis	Acute or chronic inflammation of the kidney caused by infection, degenerative processes or vascular disease
Nervine	Remedies that calm nervous excitement or act favourably on nervous diseases and the nervous system
Neuralgia	Acute paroxysmal pain radiating along the course of one or more nerves, usually without demonstrable changes in the nerve structure
Neurosis	A functional nervous disorder without demonstrable physical lesion
Night blindness	Reduced visual capacity in faint light (as at night)
Obesity	A condition characterized by excessive bodily fat
Oedema	An abnormal excess accumulation of serous fluid in connective tissue or in a serous cavity
Ointment	A salve or unguent for application to the skin
Oliguria	Reduced excretion of urine
Ophthalmia	Inflammation of the conjunctiva or the eyeball
Orchitis	Inflammation of the testicle
Otitis	Inflammation of the mucous membrane of the ear
Otorrhoea	A discharge from the external ear
Parageusia	Distortion or perversion of taste
Paralysis	Complete or partial loss of motion, sensation or function in a part of the body
Paraplegia	Paralysis of the lower half of the body with involvement of both legs
Paronychia	Inflammation of the tissues adjacent to the fingernail or toenail, usually accompanied by infection
Parotitis	Inflammation of the parotid glands, a pair of large salivary glands situated below and in front of the ear; mumps
Parturition	The action or process of giving birth
Pectoral	A drug useful for treating diseases of the respiratory tract
Pediculi	Lice of the genus *Pediculus*
Perianal	Located about or surrounding the anus
Pericarditis	Inflammation of the pericardium, the conical sac of serous membrane that encloses the heart and the roots of the great blood vessels
Phlegm	Viscid mucus secreted in abnormal quantity in the respiratory passages
Phthisis	A progressively wasting or consumptive condition, especially pulmonary tuberculosis
Piles (haemorrhoids)	A mass of dilated veins in the swollen tissue situated near the anal sphincter
Piscicidal	Lethal to fish
Pityriasis	A skin disease in which the epidermis sheds in thin scales as dandruff
Plaster	A medicated or protective dressing that consists of a film (as of cloth) spread with a medicated substance (or herbal drug)
Pleurisy	Inflammation of the pleura (a delicate serous membrane that lines each half of the thorax and is folded back over the surface of each lung) usually accompanied by fever, painful and difficult respiration, cough and exudation into the pleural cavity
Pneumonia	A disease of the lungs caused by infection or irritants, characterized by inflammation and consolidation followed by resolution
Polyuria	Excessive secretion of urine
Postnatal	Subsequent to birth
Poultice	A soft, usually heated and sometimes medicated mass spread on cloth and applied to sores or other lesions

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Prickly heat	A non-contagious skin eruption or red pimples with intense itching and tingling caused by inflammation around the sweat ducts
Prolapse	Slipping out of place of an organ or part of it (such as the extrusion of the anus or the uterus)
Prophylactic	Drugs used to prevent the attack of any particular disease
Prurigo	A chronic inflammatory skin disease marked by itching pimples
Pruritis	Itching
Psoriasis	A chronic skin disease characterized by circumscribed red patches covered with white scales
Puerperal fever	An abnormal condition that results from infection of the placental site following delivery or abortion and characterized in mild form by fever but in serious cases may spread through the uterine wall and pass into the bloodstream
Pulmonary	Relating to the lungs
Purgative	An agent that causes evacuation of the bowels
Purulent	Containing or consisting of pus; accompanied by suppuration
Pustule	A small, circumscribed elevation on the skin with an inflamed base containing pus
Pyorrhoea	A purulent discharge that contains or consists of pus
Pyrexia	An abnormal elevation of bodily temperature; fever
Rabies	An acute viral disease of the nervous system of warm-blooded animals usually transmitted through the bite of a rabid animal, causing choking and convulsions
Refractory	Not amenable to treatment or control
Refrigerant	Reducing thirst and/or having a cooling effect on the surface of the body
Remittent	Marked by alternating periods of abatement and increase of symptoms
Renal	Relating to the kidneys
Resolvent	Having the power to resolve
Restorative	A medicine or food that serves to restore a person to consciousness or rapidly to normal vigour
Rheumatism	Any of various conditions characterized by inflammation or pain in joints or muscles
Rheumatoid arthritis	A usually chronic disease of unknown cause characterized by pain, stiffness, inflammation, swelling and sometimes destruction of joints
Rhinitis	Inflammation of the mucous membrane of the nose
Ringworm	Any of several contagious diseases of the skin, hair or nails caused by fungi and characterized by ring-shaped discoloured patches on the skin that are covered with vesicles and scales
Rubefacient	An agent that causes reddening of the skin and a local increase in blood flow
Scabies	A contagious parasitic disease of the skin caused by the mite *Carcoptes scabi*; itch or mange with exudative crusts
Scald	To burn with hot liquid
Schizophrenia	A psychotic disorder characterized by loss of contact with the environment and by disintegration of personality expressed as disorder of feeling, thought and conduct
Sciatica	Pain along the course of a sciatic nerve, especially in the back of the thigh; pain in the lower back, buttocks, hips or adjacent parts
Scrofula	Tuberculosis of the lymph glands of the neck, causing their enlargment
Scurvy	A nutritional disorder caused by deficiency of ascorbic acid (vitamin C), resulting in weakness, spongy gums, and tendency to bleed under the skin and from the mucous membranes
Sedative	An agent that soothes or allays irritability
Seminal weakness	Production of 'weak' semen, presumably with a low sperm count
Sialogogue	Pruducing or increasing the flow of saliva from salivary glands
Smallpox	An acute, contagious febrile viral disease characterized by skin eruption with pustules, sloughing and scar formation

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Soporific	Causing or tending to cause sleep or dull awareness or alertness
Sore	Localized sore spot on the body
Spasmolytic	Tending to have the power to relieve spasms or convulsions
Spermatorrhoea	The involuntary discharge of semen without an orgasm
Splenic	Relating to the spleen
Splenitis	Inflammation of the spleen
Sprain	A sudden or violent twist or wrench of a joint with stretching and tearing of ligaments, but without dislocation of bones
Sprue	A chronic disease marked by fatty diarrhoea and deficiency symptoms
Stasis	A slowing or stoppage of the normal flow of bodily fluids
Steatorrhoea	An excess of fat in the stools
Sterility	Inability to conceive or cause conception
Stimulant	An agent that increases functional activity of an organ or of the whole body
Stomachic	A stimulant or tonic for the stomach
Strangury	A slow and painful discharge of urine drop by drop
Stye	An inflamed swelling of a sebaceous gland at the margin of an eyelid
Styptic	Tending to contract or bind; tending to check bleeding
Sudorific	Causing or inducing sweat
Sunstroke	Heatstroke caused by direct exposure to the sun
Suppository	A solid but readily meltable cone or cylinder of medicated material for insertion into a bodily passage (as the rectum or vagina)
Suppuration	The formation of pus; maturation (e.g. of boils)
Suppurative	Promoting suppuration
Syphilis	A chronic, contagious, usually venereal and often congenital disease caused by a spirochaete (*Treponema pallidum*) and characterized by a clinical course in three stages continued over many years
Tapeworm	Any of numerous cestode worms (as of the genus *Taenia*) parasitic when adult in the intestines
Tenesmus	A distressing but ineffectual urge to evacuate the rectum or bladder
Tertian ague	A fever (usually in malaria) marked by paroxysms of chills, fever and sweating, recurring at 48-hour intervals
Tetanus	An acute infectious disease characterized by tonic spasm of voluntary muscles especially of the jaw and caused by the specific toxin of a bacillus (*Clostridium tetani*)
Tincture	A solution of a medicinal substance in an alcoholic solvent
Tonic	An agent that invigorates, refreshes, restores or improves the normal tone of an organ or of a patient generally
Tonsillitis	Inflammation of the tonsils
Topical	Designed for local application
Trachoma	A chronic contagious conjunctivitis marked by inflammatory granulations on the conjunctival surfaces and caused by a rickettsia (*Chlamydia trachomatis*)
Tuberculosis	A highly variable communicable disease caused by the tubercle bacillus and characterized by toxic symptoms or allergic manifestations which in humans primarily affect the lungs
Tumour	Generally any abnormal swelling of the body other than those due to direct injury
Tympanites	A distension of the abdomen caused by accumulation of gas in the intestinal tract or peritoneal cavity
Typhoid (fever)	A communicable disease caused by a bacterium (*Salmonella typhi*), usually acquired through contaminated food, marked by fever, diarrhoea, prostration, headache and intestinal inflammation
Ulcer	A break in skin or mucous membrane with loss of surface tissue, disintegration and necrosis of epithelial tissue, and often pus; an open sore
Urethritis	Inflammation of the urethra
Urinary complaints	Disorders of the urinary system

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Urticaria	An allergic disorder marked by raised oedematous patches of skin or mucous membrane and usually intense itching, caused by contact with a precipitating factor either externally or internally
Uterine	Relating to the uterus
Uterine disorders	Irregularity in the normal functioning of the uterus or womb
Vaginal	Relating to the vagina
Varicose veins	Abnormally dilated or contorted veins; varicosis
Vasodepressant	An agent that widens the lumen of blood vessels, due to either vasodilator action or failure of vasoconstrictor activity
Venereal diseases	A contagious disease, such as gonorrhoea or syphilis, that is typically acquired in sexual intercourse
Vermicidal	An agent that kills parasitic worms
Vermifuge	An agent that expels parasitic worms
Vertigo	A disordered state in which the individual or his/her surroundings seem to whirl dizzily; giddiness
Vesicant	An agent that induces blistering
Vitiligo	A skin disorder manifested by smooth white spots on various parts of the body
Vulnerary	A remedy useful in healing wounds
Wasting disease	Diseases causing gradual loss of weight, strength and vitality
Whitlow	An archaic term for any suppurative inflammation on a finger or toe
Whooping cough	An infectious disease especially of children caused by a bacterium (*Bordatella pertussis*) and marked by a convulsive spasmodic cough sometimes followed by a crowing intake of breath
Yaws	An infectious, communicable (but not venereal) disease caused by a spirochaete (*Treponema pertenue*) which cannot be distinguished morphologically from the syphilis spirochaete (*T. pallidum*) and that is characterized by a primary ulcerating lesion on the skin followed by a secondary stage in which ulcers develop all over the body, and by a third stage in which the bones are involved.

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Glossary of Botanical Terms

Achene	A dry, wingless, indehiscent fruit, usually 1- or 2-seeded, the pericarp adnate to the seed
Aculeate	Furnished with prickles
Acuminate	Sharp-pointed, tapering gradually or abruptly with the sides of the apex somewhat concave
Acute	Short-pointed, tapering to a point
Adventitious	Arising in other than the usual location (usually referring to roots or buds)
Alate	Winged
Alternate	Inserted at different levels along the stem, not opposite (leaves)
Amplexicaul	Said of a sessile leaf or the base of a petiole when clasping the stem
Annual	A plant with a 1-year life cycle
Annulate	Ringed by circumferential grooves or ridges
Apex	The tip or distal end
Apiculate	Tipped with a small sharp point that is not an extension of the mid-vein
Appressed	Closely and flatly pressed against; adpressed
Arcuate	Curved like a bow
Aril	An appendage or an outer covering of a seed, arising from or near the hilum or funicle, sometimes appearing as if pulpy
Articulated	Jointed
Attenuate	Drawn out into a long, slender point
Auricle	An ear-shaped part or appendage, as the projections at the base of some leaves and petals
Auriculate	With a small earlike lobe (auricle) on either side of the petiole or stipule base
Awn	A bristle-like part or appendage, especially of the glumes of grasses
Axillary	Arising from the axils of foliage leaves
Axis	The main line of development
Berry	A simple fruit containing one or more seeds, usually indehiscent, arising from a single pistil, fleshy throughout with a homogeneous texture

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Biannual	A plant with a 2-year life cycle
Bifid	Two-lobed
Bipinnate	Twice or double pinnate
Bisexual	Hermaphroditic; having both male and female reproductive organs (flowers)
Biternate	Double trifoliate; double ternately compound
Blade	The expanded part of a leaf or petal
Bract	A small leaf subtending the flower or flower stalk
Bracteole	A small bract on the pedicel, or close under the flower
Branchlet	The ultimate division of a branch; a twig
Bulb	A short stem, more or less conical above and flattened underneath, usually underground, which bears a bud or buds concealed in fleshy scales or coats
Bulbil	A miniature bulb produced in leaf axils or in leaf sinuses
Buttressed	Said of stems with vertical projections at the base
Caducous	Falling off early
Callus	A hard, thickened area
Calyptra	A covering of a flower or fruit resembling a cap or hood
Calyx	A descriptive term for the outer whorl of usually green leaf- or bract-like perianth leaves (sepals)
Calyx tube	The tube of a gamosepalous calyx
Campanulate	Bell-shaped; with a broad tube about as long as or longer than broad and a flaring limb or lobes
Capitate	Head-shaped; inflorescence a capitulum (head) with sessile flowers
Capsule	A dry fruit composed of more than one carpel, each with more than one seed; capsules either dehiscing valvular, loculicidally, septicidally or operculate
Carinate	Keeled; provided with a projecting central longitudinal line or ridge
Carpel	One of the foliar units of a compound ovary or pistil
Caryopsis (*pl.* caryopses)	A grain; the seedlike-fruit of grasses with thin pericarp
Catkin	A spike-like (or spicate) inflorescence
Caudate	Tailed or bearing a tail-like appendage
Cauliflorous	Bearing flowers or inflorescences directly on the main stem or older branches
Cauline	Borne on the stem
Chartaceous	Papery, opaque but thin
Ciliate	With a row of fine hairs
Ciliolate	Diminutive of ciliate; minutely ciliate
Cladode	A branch, more or less flattened, which assumes the form and function of a leaf
Clavate	Club-shaped
Claw	The long, narrow, often petiole-like, base of petals and sepals of some flowers
Cleft	With sinuses extending somewhat more than halfway from margin to mid-vein
Coccus (*pl.* cocci)	One of the parts of a lobed or deeply divided fruit, when each part is one-seeded
Coma	A tufted bunch of seed hairs or crown of bracts
Compressed	Flattened laterally
Concave	Shallowly hollowed; saucer-like
Connate	Like parts (usually leaves) fused/grown together
Convex	Rounded outward
Cordate	With two lobes giving a heart-shaped appearance
Coriaceous	Leathery and thickish
Corm	A solid fleshy underground stem more or less jointed, and naked
Corolla	The inner whorl of perianth leaves (petals), often coloured
Corymb	An indeterminate, flat- or convex-topped inflorescence in which the

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	branches and sometimes also the pedicels start from different points but all reach to about the same level
Costate	Having one or more, usually raised, longitudinal ribs or nerves
Creeper	A tight-clinging vine or trailing shoot that takes root along its length
Crenate	With obtuse or rounded broad teeth that may be directed forward or at right angles to the mid-vein
Crenulate	Finely crenate
Culm	Stem, particularly that of a grass
Cuneate	With a narrow to broad wedgelike taper, acute, the sides straight
Cuneiform	Wedge-shaped, widest near or at the apex
Cupule	Cuplike structure at the base of some fruits formed by the dry and enlarged floral envelopes
Cuspidate	With a sharp, rigid point (apex)
Cyme	An inflorescence in which the central flower opens first (centrifugal), with a flat-topped or convex structure
Cymose	Inflorescence a cyme
Cystolith	A calcium carbonate concretion arising from the cellulose wall of a plant cell
Deciduous	Falling off eventually (for a tree, leafless for part of the year)
Decumbent	Reclining or lying on the ground with the end ascending
Decurrent	Extending down and fusing to the stem
Decussate	A special arrangement of opposite leaves, with the leaves of one pair emerging and disposed at right angles to the pair above and below
Deflexed	Reflexed
Dehiscent (fruits)	Splitting up, opening (fruit)
Deltoid	More or less equilaterally triangular
Dentate	With sharp rather coarse teeth that point outwards from the mid-vein
Denticulate	Finely dentate
Dichasium	A determinate cluster of three flowers arising from a common peduncle by dichotomous branching immediately beneath a terminal flower
Dichotomous	Forked, in one or more pairs
Diffuse	Loosely branching or spreading
Digitate	Handlike; a compound leaf in which all the leaflets are borne from the apex of the petiole
Dioecious	A plant bearing flowers of only one sex
Disc floret	The tubular flower of some members of the *Asteraceae*
Distichous	An alternate arrangement with adjoining leaves on opposite sides of the twig in one plane
Divaricate	Spreading very far apart; widely divergent
Dorsal	Relating to or situated near or on the back
Drupe	A simple, 1-seeded fruit, usually indehiscent, arising from a single pistil, fleshy throughout with a heterogeneous texture and a soft exterior
Echinate	Covered with stiff, long spines (fruit)
Elliptical	Broadest midway between the base and apex; oval (2 : 1–3 : 2), narrowly elliptic (6 : 1–3 : 1)
Emarginate	With the apex markedly notched but not lobed
Endemic	Native or confined naturally to a particular and usually restricted area or region
Endocarp	Inner layer of pericarp or fruit wall
Endosperm	The starch- and oil-containing tissue of many seeds
Ensiform	Sword-shaped
Entire	Uncut, without indentation
Epicalyx	A whorl of bracts below the calyx and somewhat resembling it in shape and colour
Epiphyte	Perennial plant growing on other plants, but not parasitically
Exalbuminous	Without albumen (the nutritive substance found within the seed-coats of some seeds)

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Exfoliate	To cast off in scales, sheets or splinters
Exocarp	Outer layer of pericarp or fruit wall
Exserted	Projecting beyond an enclosing organ or structure
Falcate	Sickle-shaped
Fascicle	A cyme in which the flowers are clustered
Fasciculate	With leaves in clusters, often subtended by a bracteate sheath
Ferrugineous	Rusty-brown
Fetid	Having a disagreeable odour
Fig	Synconium; common receptable of inflorescence finally becoming a fleshy, hollow pseudofruit (in *Ficus* spp.)
Filament	The anther-bearing stalk of a stamen
Filiform	Threadlike, often flexuous, very slender and cylindrical
Floret	An individual flower, usually minute, especially of grasses and composites (*Asteraceae*)
Follicle	A dry fruit formed from a single carpel and usually dehiscing along one suture
Fructification	Fruit- or spore-producing structures
Fulvous	Of a dull brownish-yellow colour
Funicle	The stalk of a seed by which it is attached to the placenta
Fusiform	Spindle-shaped; narrowed at both ends from a swollen mid-region
Glabrate	Essentially glabrous, but on close examination found to have very sparse or minute vestiture
Glabrescent	Becoming glabrous or nearly so
Glabrous	Smooth, devoid of hairs or hairy covering
Gland	A secreting part of prominence or appendage; often used to describe a gland-like body
Glandular	With glands
Glandular-pubescent	A general term indicating presence of hairs and glands intermixed on a surface
Glandular-punctate	The epidermis having minute glands, translucent when pale or amber-coloured (viewed by transmitted light) or blackish
Glaucescent	Bluish sea-green
Glaucous	Covered with a very fine bloom of wax (as on grapes)
Globose	Spherical, globular, bulb-shaped
Glume	The chaffy, bract-like scales of the inflorescence of grasses and their allies
Granulate	Having a grainy texture
Gregarious	Growing in large colonies
Habitat	The type of locality and immediate environment in which a plant grows
Hastate	With a pair of basal lobes flaring outwards
Head	An inflorescence consisting of a more or less dense cluster of sessile flowers which are centripetal in evolution; capitula
Herbaceous	Herb-like
Hermaphrodite	Having both male and female reproductive organs (flowers)
Heterogamous	Having flowers of two kinds (pistillate and perfect)
Hilum	Scar left by funicle on seed
Hirsute	Covered with short erect stiff (but not harsh) hairs
Hispid	Bristly, bearing dense, erect, straight, harshly stiff hairs
Homogamous	Having flowers alike throughout inflorescence; stamens and pistils maturing during the same period
Hyaline	Thin and almost transparent (translucent)
Hygroscopic	A changing of form or position through changes in moisture content
Imbricating	Overlapping
Imparipinnate	A compound leaf with pinnate leaflets and one apical (terminal) leaflet
Incised	A margin cut jaggedly into very deep teeth
Included	Not protruded beyond the enveloping structure; not exserted

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Indehiscent	Not splitting open when ripe (fruit)
Inflorescence	The arrangement of flowers on a plant
Infructescence	Inflorescence in fruiting stage
Internode	The portion of stem or branchlet between two nodes
Involucel	A secondary involucre
Involucre	One or more whorls of bracts situated below and close to a flower
Keel	A projecting longitudinal ridge, like the keel of a boat
Kernel	The inner soft part of a seed, fruit stone or nut
Lanceolate	Lancet-shaped (broadened at the base and tapering toward the apex); 3–6 times as long as wide
Latex	The milky juice of some plants
Lax	Loose in texture or arrangement; opposite of crowded
Leaflet	The separate divisions of a compound leaf
Legume	A dry, dehiscent fruit, 1- to many-seeded, dehiscing by two longitudinal sutures
Lenticel	A lentil-shaped corky process developed on the bark of some trees' stems or branches
Lenticellate	With lenticels: small openings with thickened margins (on twigs, branches or stems)
Lenticular	Lens-shaped
Ligulate	Strap-shaped, as in the corolla of a ray flower in most species of the family *Asteraceae*
Ligule	The membranous appendage at the top of leaf sheaths of most grasses
Limb	The expanded portion of a petal or leaf, especially of a gamopetalous corolla
Linear	Long and narrow, flattened, the sides parallel or nearly so
Lineolate	Marked with fine lines
Lobed	With sinuses not more than halfway from margin to mid-vein
Lyrate	Having or suggesting the shape of a lyre
Membranous	Thin and semi-transparent
Mericarp	A portion of a fruit which splits away as a perfect fruit
Mesocarp	The middle layer of a pericarp (ovary or fruit wall)
Midrib	The middle or main rib of a leaf
Monoecious	A plant bearing bearing unisexual flowers, but with both male and female flowers on the same plant
Mucilaginous	Sticky, viscid; full of or secreting mucilage
Mucronate	Abruptly tipped with a shoot projection of the mid-vein; conically-pointed
Muricate	Surface covered with obtuse, minute tubercles or spines
Naturalized	Introduced from outside its native range and established naturally in its new environment
Node	The point on the stem or branch at which a leaf or branch is borne
Nut	A dry, wingless, indehiscent fruit, usually 1- or 2-seeded, usually large, with a thick and hard pericarp
Obcordate	With the apex 2-lobed, inversely heart-shaped
Oblanceolate	Broader above the middle and tapering toward the base; inversely lanceolate
Oblique	With the lowermost sides markedly unequal
Oblong	Rectangle-shaped (2 : 1–3 : 1); narrowly oblong (6 : 1–3 : 1); transversely oblong (2 : 3–1 : 2)
Obovate	Egg-shaped, broader above the middle; inversely ovate (2 : 1–3 : 1); depressed obovate (2 : 3–1 : 2)
Obtuse	With a rounded apex, blunt
Oleaginous	Containing or producing oil
Opposite	With two leaves at a node, one on the opposite side of the twig from the other
Orbicular	Circular or nearly so

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Ovate	Egg-shaped, broader below the middle
Ovoid	Egg-shaped (three-dimensional)
Palmate	With the midribs of the lobes or leaflets all radiating from the apex of the petiole
Pandurate	Fiddle-shaped, a modification of obovate
Panicle	An inflorescence with an indeterminate branch system whose primary axis bears branched secondary axes and pedicellate flowers
Papillose	Bearing small, nipple-like protuberances
Pappus	A hairy tuft on achenes and fruits
Parasite	A plant, either non-chlorophyllous, dependent upon other plants for all nourishment, or chlorophyllous, dependent upon other plants for water and mineral salts
Paripinnate	Compound leaf with an even number of pinnate leaflets (no terminal leaflet); even-pinnate
Pectinate	Having narrow parallel projections or divisions suggesting the teeth of a comb
Pedicel	The stalk supporting a single flower
Peduncle	A common leafless stalk supporting several flowers
Pedunculate	Supported by a peduncle
Pellucid	Admitting passage of light without diffusion or distortion
Peltate	With the petiole attached at or near the centre of the lower surface of a usually orbicular blade; shield-shaped
Pendulous	Hanging vertically
Perennial	A plant with perennating organs (bulbs, tubers, corms, rhizomes) underground
Perianth	A collective term for the calyx and corolla
Persistent	Remaining attached; not falling off
Petals	Corolla leaves, inner whorl of often coloured perianth leaves
Petiolate	With a petiole
Petiole	Leaf stalk
Petiolule	Leaflet stalk
Pilose	Clothed with soft, very long, rather straight hairs, not dense but somewhat shaggy
Pinna (*pl.* pinnae)	The primary division of a bipinnate or tripinnate leaf
Pinnate	With leaflets arranged on each side of a common petiole
Pinnatifid	With the margin pinnately cleft or parted; feather-like
Pinnatisect	Cut down to the midrib in a pinnate fashion
Pinnule	The secondary division of a tripinnate leaf
Pistillate	(Flowers) having pistils but no stamens
Pistillodes	A rudimentary or vestigial pistil present in some staminate flowers
Placenta	The part of the carpel bearing ovules
Plicate	Folded, as in a fan, or approaching this condition
Plumose	Feathery
Pod	A dry and many-seeded fruit (legume)
Polygamous	Bearing both hermaphroditic and unisexual flowers
Polymorphic	Occurring in various forms
Prickly	Covered with prickles, spine-like excrescences of bark
Procumbent	Having stems that trail along the ground without rooting
Prostrate	Horizontal, lying (stem)
Puberulous (puberulent)	Covered with exceedingly short, fine, rather dense straight hairs at right angles to the surface
Pubescent	A general term meaning hairiness of any type; opposite of glabrous
Pyrene	Putamen: stone lying in hard layer formed by inner parts of mesocarp (drupe)
Pyriform	Pear-shaped
Pyxidium	Woody capsule dehiscent by means of an operculum (fruits of *Lecythidaceae*)

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Quadrangular	Four-cornered
Quadrifoliate	Leaf composed of 4 leaflets
Raceme	An inflorescence with an indeterminate single axis bearing pedicellate flowers
Racemose	Having flowers in raceme-like inflorescences that may or may not be true racemes
Rachis	Main axis of inflorescence or compound leaf
Radical	Arising from the root or its crown; said of leaves that are basal or in rosettes
Ray (floret)	Outer modified floret of some composites (*Asteraceae*), with an extended strap-shaped part to the corolla; also a branch of an umbel
Receptacle	A flattened floral head (as in some *Asteraceae*)
Reflexed	Bent, turned or directed back
Reniform	Kidney-shaped
Repand	Obtusely-incised, obtusely dentate, finely sinuate
Reticulate	Bearing a net-like pattern represented by weak grooves or colour variegation outlining the veinlets beneath; or slight wrinkling as of a seed coat
Retuse	With a rounded apex very slightly notched at the terminus of the midvein
Revolute	Rolled backward or downward
Rhizome	An underground or prostrate jointed stem which sends off roots at the nodes and bears buds, leaves or scales
Rhomboid	Three-dimensionally rhombic, diamond- or lozenge-shaped
Rosette	A cluster of leaves in crowded circles or spirals arising basally from a crown or apically from an axis with greatly shortened internodes
Rotate	Wheel-shaped; with a very short tube and a broad limb at right angles to it
Rufous	Reddish, ruddy, sandy
Rugose	With deeply grooved reticulation over a network of veinlets
Salverform	With a long corolla tube and a shorter limb that is at right angles to it
Samara	A dry, winged, indehiscent fruit, usually 1- or 2-seeded
Saprophyte	A plant, usually lacking chlorophyll, living on dead organic matter
Scabrous (scabrid)	Rough, uneven; covered with scattered harsh hairs, not erect, usually with enlarged bases
Scale	Any small, usually dry, appressed leaf or bract, often only vestigial
Scandent	Climbing
Scape	A leafless and generally unbranched flower stem rising from the ground
Scarious	Dry and membranous in texture
Schizocarp	A dry, dehiscent fruit, 1- to many-seeded, splitting into 1-seeded portions (mericarps)
Segment	One of the divisions of a leaf, petal, sepal or bract that is divided but not compound
Sepals	The outer, usually green leaf- or bract-like structures of the calyx
Septate	Partitioned; divided by partitions
Seriate	Arranged in rows
Sericeous	Silky-haired
Serrate	With sharp rather coarse sawlike teeth pointing forward
Serrulate	Finely serrate
Sessile	Lacking a stalk (or petiole, for leaves)
Setaceous	Set with or consisting of bristles
Sheath	Any long, more or less tubular, structure surrounding an organ or part
Siliceous	Containing silica or a silicate
Sinuate	Undulating in one plane (leaf margin)
Sinus	The space or recess between two lobes or divisions of a leaf or other expanded organ
Sorus (*pl.* sori)	Sporangia of a fern arranged in tiny, distinct clusters

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Spadix	A spike-like inflorescence with a fleshy axis, usually subtended or enveloped by a large leafy bract, or spathe (in the *Araceae*)
Spathe	A large leafy bract subtending or enveloping the inflorescence (spadix) in the family *Araceae*
Spathulate (spatulate)	Similar to oblanceolate but tapering to a very narrow base
Spicate	Inflorescence a spike
Spike	An inflorescence with a single elongate axis bearing sessile flowers
Spikelet	A secondary spike; the ultimate flowering stem of grasses and sedges including its glumes and flowers
Spinescent	Covered with spines, usually minute ones
Spiny	Bearing one or more modified stems, leaves or stipules reduced to spines
Sporocarp	A body or receptacle containing sporangia (as in *Marsilea*)
Staminate	(Flowers) having stamens but no pistils
Standard	The upper and broad, more or less erect, petal of a papilionaceous flower (in *Fabaceae-Papilionoideae*)
Stellate	Arranged star-like; bearing forked or multiple-branched hairs, each on a central stalk, or sessile
Stipe	A short stalk (fruit)
Stipel	Minute stipule at the base of the leaflets of a compound leaf
Stipule	Leaf-like or scar-like appendage of a petiole, usually at both sides of its base
Stolon	A shoot that bends to the ground and takes root; a horizontal stem at or below the surface of the ground that gives rise to a new plant at its tip
Striate	Marked (often by colour differences) by longitudinal lines
Strigose	With harsh, straight, stiff, short hairs, mostly appressed or weakly ascending, bristle-like in harshness
Style	Mostly elongate part of a pistil at apex of ovary
Subtend	To occupy an adjacent and usually lower position so as to embrace or enclose
Subulate	Awl-shaped, tapering from the base to apex and usually sharp-pointed
Succulent	Juicy, fleshy; soft and thickened in texture (leaves or stems)
Sulcate	Furrowed with longitudinal grooves
Suture	A line of opening or dehiscence
Syncarp	Fruit composed of 2 or more combined carpels
Tawny	Brownish-orange to light brown
Tendril	A rotating or twisting threadlike structure by which a plant grasps an object and clings to it for support; morphologically it may be a stem, leaf or leaflet
Terete	Cylindrical in cross-section
Tessellated	Having a chequered appearance
Testa	Outer coat of a seed
Throat	In flowers, the opening or mouth of the tube or a gamopetalous corolla; the place where the limb becomes differentiated from the tube
Thyrse	An inflorescence consisting of a rachis bearing cymes in the axils of bracts
Tomentose	Covered with more or less matted woolly hairs, curled and appressed to the surface
Tomentulose	Diminutive of tomentose
Tomentum	A covering of more or less matted woolly hairs
Torus (*pl.* tori)	Receptacle
Trichome	A hair or bristle
Trichotomous	Divided or dividing into three parts
Trifoliate	Leaf composed of 3 leaflets
Trigonous	Three-dimensionally triangular
Tripinnate	Thrice pinnate
Triquetrous	Sharply 3-cornered

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Truncate	Cut off more or less squarely at the base or apex
Tuber	A thickened underground stem bearing buds or eyes
Tubercles	A small knobbly prominence or excrescence
Tubercular	With tubercles, bumpy
Turbinate	Top-shaped; inversely conical
Umbel	An inflorescence with rays or pedicels arising from the same point, like the ribs of an umbrella
Umbellate	With umbels, pertaining to umbels
Umbellule (umbellet)	The secondary umbel of a compound umbellate inflorescence
Undulate	With a wavy margin (leaf)
Unifoliate	Compound leaf with only 1 leaflet
Utricle	A dry, wingless, indehiscent fruit, usually 1- or 2-seeded, the pericarp loose and free from the seed
Valvate	Opening by valves; meeting by the edges without overlapping
Valve	A separable part of a pod; the units or pieces into which a capsule splits or separates on dehiscing
Variegated	Having discrete markings of different colours
Venation	A mode in which the veins are disposed in a leaf
Verrucose	Warty
Verticillate	Whorled, arranged in verticils or whorls (leaves)
Villous	Bearing moderately dense, long, soft, often curly hairs, more or less erect but not necessarily straight
Viscid	Covered with a sticky exudate
Voluble	Twining
Whorled	With three or more leaves at a node, verticillate
Wing	Any thin, membranous appendage
Woolly (lanate)	Covered with dense, long, soft, entangled, curled hairs, not appressed close to the surface

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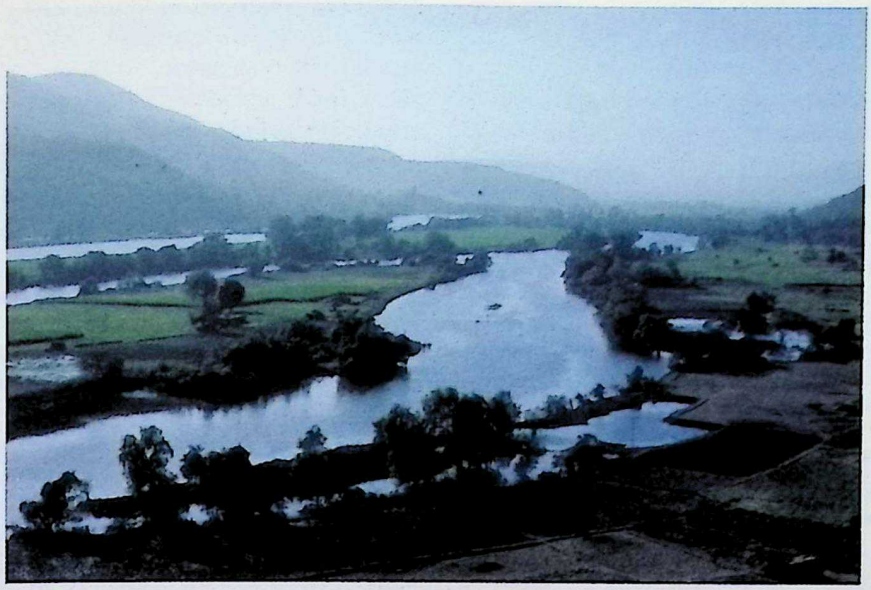

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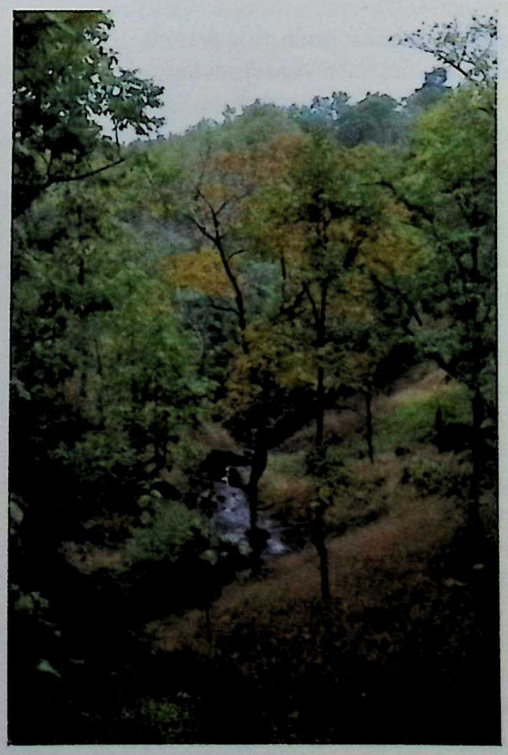

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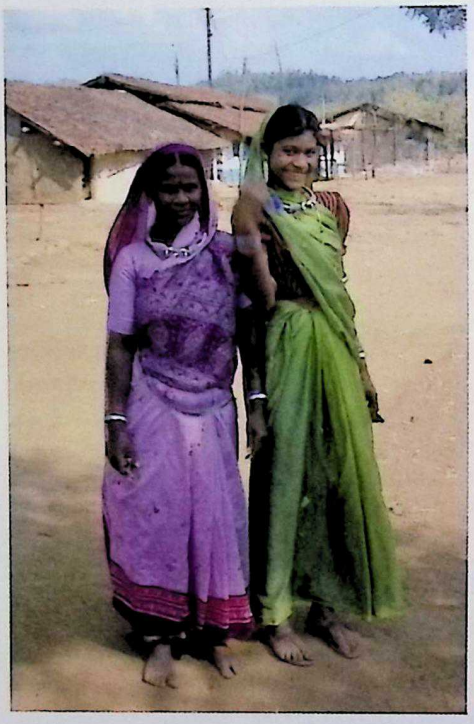

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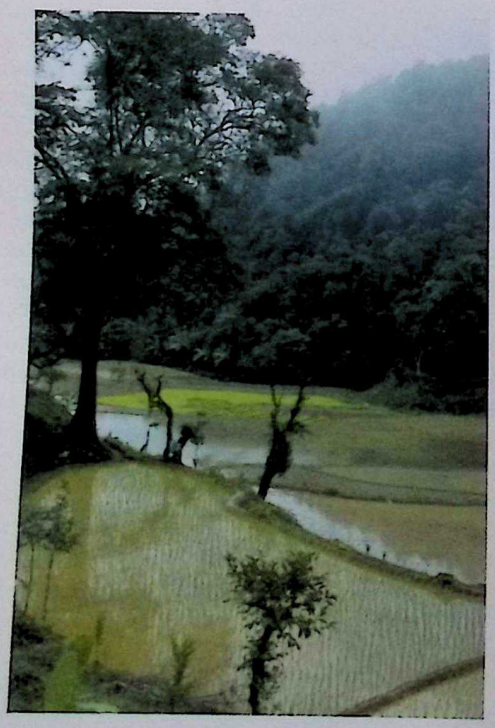

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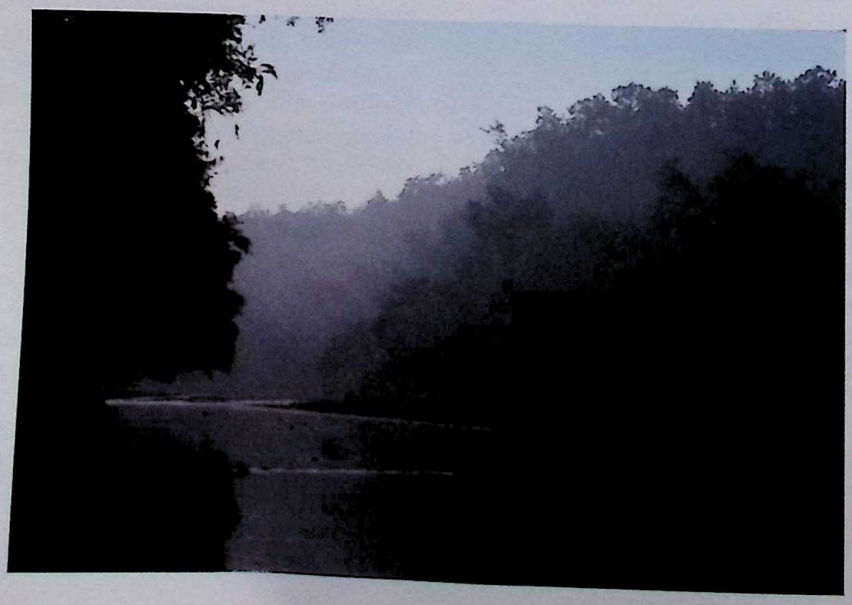

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